

**REMARKS**

- 3.0 Objection is raised under 37CFR1.83(a). The first objection is in respect of a feature which was present, in error, in claim 31 but which was corrected in the preliminary amendment of 7 November 2002. Accordingly there is no remaining reference in the claims as previously amended to the outward curvature of the initiator region progressively "decreasing" from the initiator region to the flexure region. It is submitted that Figures 2b and 6b, for example, clearly show a smooth merging of the initiator region with the flexure region and a progressive variation in outward projection. In respect of the second feature, namely the flexing of the flexure region resulting in an outward curvature of the flexure region lessening, it is submitted that this again is a feature which is clearly shown in the original figures such as Figures 3 and 5 for example. Those Figures illustrate one particular embodiment where the outward, convex curvature, has, with full flexing of the flexure region, become concave but clearly the transition from the convex to the concave curvatures constitutes a "lessening".
- 3.1 The Applicant has however proposed, if required, the inclusion of additional Figures 4d, 10 and 11 which are additional cross-sectional views of the original figures and illustrate what was previously described and claimed. There is therefore no new matter described or illustrated by the inclusion of these additional drawings.
- 3.2 Objection is raised under 35USC112 in respect of claims 29, 69 and 70.

- 3.3 In respect of claim 29, as stated previously above, originally filed Figures 3 and 5 particularly show how the flexing of the flexure region will result in its outward curvature lessening so that depending on the amount of the deflection the original outwardly convex curvature will become an inwardly directed concave curvature. Figures 11a-d if required further clarify the original drawings and illustrate this effect.
- 3.4 In respect of claim 69 the provision of a flattened middle region is clearly described and illustrated in respect of the embodiment of Figure 8a.
- 3.5 In respect of the objection to claim 70, this refers to the feature of the initiator portion having regions of opposite projection relative to the projecting portion and is in specific reference to the embodiment described and illustrated in Figures 8b to 8d where a lower initiator portion 800<sup>1</sup> is initially disposed in an opposite direction of projection to the projecting portion 500<sup>1</sup>.
- 3.6 Claims 27-42, 47, 38, 51-54 and 54-70 are rejected under 35USC102(b) in view of Brown; claims 27-36 are rejected under 35USC102(b) in view of Vaillencourt; claims 27-42, 47-48, 51-54 and 64-70 are rejected under 35USC102(b) in view of Provent; and claims 27-42, 47-48, 51-54 and 64-70 are rejected under 35USC102(e) as being anticipated by Krishnakumar.
- 3.7 The Applicant has now amended all its independent claims 27, 37, 47, 48, 64, 65 and 68 so as to specifically require that the initiator region is longitudinally displaced from the flexure region to define two distinct and separate regions. Also in claims 37,48,64 and 68 the further feature is introduced of the direction of flexing

of the flexure region being the same as and parallel with the flexing of the initiator region. The equivalent feature of the longitudinal displacement has been also included in the proposed new claims 71, 72, 73 and 77.

This flexing is in a single direction and to further distinguish over the prior art this has also been specifically referred to in Claims 64, 68 and 73.

Claims 72 and 73 also specifically state that the projections of the flexure and initiator regions are both relative to a single axis.

3.8 It is respectfully submitted that the above claims are both novel and inventive over and above any disclosure in any of the citations either alone or in combination.

3.9 Referring firstly to Brown, the cross-sectional view of the flexure region 25 as shown in Figure 3 of Brown is clearly different to the structure described and claimed by Melrose. A comparison with Melrose Figures 2 and 4 particularly illustrates this. If, as is stated in the office action, the initiator region in Brown is the region between Brown reference 25 and hinge 27, then that initiator region is not longitudinally displaced from the Brown flexure region as is now a specific requirement of the amended claims of the present application. There is no disclosure or suggestion in Brown to provide an initiator portion which is longitudinally displaced relative to the flexure region. Also, if the hinge strip 27 is considered to be the "initiator portion" of Brown which appears to be the teaching, see Column 3 lines 42 to 45, then what is taught is an outwardly concave, not projecting or convex, strip, which is required to totally surround the "bulged surface 25". This will result in the "bulged surface 25" snapping into an inverted position so that recovery towards its original position is not indicated, see column 3 lines 42

to 45. Moreover, Brown teaches that its outward curvature of the flexure region inverts to assume an inward position under vacuum pressure and the outward bulging of the panels of Brown, see particularly Figures 2 and 3, disclose a convexity in both the longitudinal and transverse extents of the Brown flex panel. In complete contrast to Brown, Melrose teaches the initiator portion being positioned longitudinally from the flexure region such that this longitudinal displacement causes the flexure region to progressively reduce in outward curvature to accommodate vacuum pressure and with the movement of the initiator region and the flexure region being in the same parallel direction relative to their longitudinal displacement. Importantly, as Brown teaches convexity in both longitudinal and transverse extents, as vacuum pressure builds this will provide a resistance to inversion, in complete contrast to Melrose where the initiator portion is providing an early response to vacuum pressure. What Brown teaches is effectively a dome structure with its inherent rigidity, which is in complete contrast to the teaching of Melrose. A Finite Element Analysis (FEA) of vacuum pressure build up of a container constructed according to the teaching of Brown, compared with an FEA of a container according to the teaching of the present invention, available as Appendices B and A respectively, clearly show that the Brown and Melrose containers function totally differently in response to vacuum pressure. See Declaration of David Melrose. Brown would be unable to achieve what is achieved by the Melrose container, where the respective outward curvatures of the flexure and initiator regions allow for a progressive lessening of the curvatures. This is a feature entirely absent from Brown. There is in fact in Brown no assertion that its panels could progressively lessen in "bulge" but merely proposes that its panels are capable of inverting under vacuum pressure. Inversion, as proposed by Brown, is a "forced-flipped"

inversion that is an instantaneous concaving of the panel due to great pressure. Force flipped inversions do not automatically revert back to the original convex position upon removal of the vacuum pressure, in contrast to the teachings of the current invention. See for example, page 5, lines 22- end, and page 6 lines 1-8 of the specification as filed. Investigation by the Applicant has also been unable to find any evidence of the Brown container ever having been commercialised which is in complete contrast with the present invention which has been used in numerous commercial containers available in the United States of America through its United States licensee, Graham Packaging, and in Australia and New Zealand. Examples of the commercial containers using the present invention are attached in Exhibit 1.

3.10 Referring to Vaillencourt, its outwardly projecting portions 43 and 44 are extensions of the "centre raised panels" which are well known as "islands" in the prior art. These extensions connect, or tie, to the edges of the vacuum panel and are therefore referred to as connecting portions see column 5 lines 40 to 48. These are different structures to the "connecting portions" in the present invention. The Vaillencourt connecting portions are intended to control the flexing of the vacuum panel by strengthening the adjacent area, being the upper and lower vacuum panel flexure regions. Such strengthening is gained by causing the panel to be less flexible in this region. This is entirely in contrast with the present invention which requires the panels to be more flexible in this region. The "flexure region" of Vaillencourt, as far as it has any equivalent to the "flexure region" of Melrose, is the "back surface" 31 of Vaillencourt. This is not associated with, or controlled by, any equivalent of the "initiator portion" of Melrose.

3.11 In Vaillencourt, as in many instances of the prior art, its "islands" are provided for support of a container label. While such "islands" may be described as being outwardly projecting centre raised portions, it is well recognised that they do not flex inwardly to any significant degree within themselves. They do not reverse in curvature, and they are not intended to do so, as if they did, they would not be able to fulfil their purpose, which is to support the label when the container is under vacuum pressure. As stated at column 6, lines 49 to 55: " The transverse rib 45 acts as a hinge for the two panel portions 41 and 42 .....in such a manner that the outwardly projecting center portion 40 does not collapse inwardly or deform at any region within the center of the panel portion.....". This is clearly shown particularly in Figure 9. There is no reduction of convexity in Vaillencourt. Also see column 8 lines 49 to 52: "....permitting the center portions of the vacuum panels 24 to flex freely inwards and without deforming the panels..."As the "back surface 31" of Vaillencourt is the closest equivalent of the "flexure region" of Melrose, it then follows that there is no flexure region in Vaillencourt which "projects outwardly" as is a requirement of Melrose. The connecting portions "43" and "44" of Vaillencourt are, and act as, extensions of the Vaillencourt "islands" and no part of these extensions act in any way as the "initiator portions" of Melrose. These Vaillencourt connecting portions do not reverse in curvature nor do they provide any operative connection with the Vaillencourt back surface 31 to assist in, or trigger, the flexing of that back surface. Although Vaillencourt identifies the back surface 31 as providing an area in the upper and lower regions that "reverses the curvature" of the region, what this means is that the curvature of the back surface 31 is concave but the connecting portion (which is convex) intersects with it and thus the connecting portion

"reverses" the curvature through the region. The connecting portion itself does not physically change from a convexity to a concavity and further does not then cause the attached "island" convexity to then invert and become concave.

3.12 To assist the examiner's understanding of the teaching in Vaillencourt the applicant has constructed a container having six panels according to the teaching of Vaillencourt and has provided in Appendix C an FEA of the vacuum pressure built up of this container. It will be noted from this that the connecting portions while being outwardly projecting do not invert their flexure and cause the islands to invert. See Declaration of Melrose. Their effect is to provide increased rigidity to the panel and in particular the upper and lower areas. In doing so vacuum performance potential is actually reduced in the Vaillencourt container. A prior art container would have better vacuum compensation without the Vaillencourt connecting portions than with them. The applicant having made investigations has not been able to find the Vaillencourt container in commercial production anywhere. Once again this is in complete contrast to the extensive commercial production of the present invention in containers in the United States of America and elsewhere.

3.13 Referring now to Provent this again teaches an outward double convexity (dome) which the present invention, especially as now claimed, is clearly distinguished from in the provision of an initiator portion longitudinally displaced from the flexure region and moving in the same direction when flexing. Page 1 lines 32 to 35 of Provent when translated reads: "...This cap(2) which can be spherical, is surrounded by a plain band 3 linked to the cap by a

part 4 preserving a relatively big radius curve. This part plays the role of a hinge....".

3.14 While Provent was not apparently cited as a prior art reference to Brown, it in fact discloses the same concept as Brown, namely a panel configuration that is convex in all directions and surrounded by a hinge mechanism. As seen particularly from Figures 2 and 3 of Provent its panel projects outwardly in both horizontal and vertical planes. Such "double outward" convexity or "dome" structure is in complete contrast to the current invention. As previously discussed, a panel that is convex in both planes, and surrounded by a circumferential section that is less outwardly projecting, is not able to provide for a controlled inversion such that the panel will invert in a direction parallel to the initiator region. In a panel such as Provent or Brown this would lead to perpendicular opposition of movement. That the outwardly convex portion increases in convexity as vacuum pressure is applied is of course the principle by which a dome structure achieves its strength. The present invention in complete contrast provides for the outwardly projecting convexity to decrease in convexity under vacuum pressure. Further, both Provent and Brown seek to provide an invertible central portion. The current invention in contrast provides for an outwardly projecting panel portion that can reduce in convexity in a controlled manner such as it does not "snap" to an inverted position. References again to Appendices A and B compare and contrast the performance of a container according to the present invention and containers which share that general structure but having panels which are outwardly convex in opposing planes such as found in Brown, Provent and Krishnakumar. Manual application of force to the panel area in the Melrose container will only cause the outwardly projecting panel to



reduce in outward convexity from initiator to flexure regions above and below. This is clearly not the case with the comparison containers where force applied to any of the areas of lesser outward projection can never cause the centre portion to invert. Absolute pressure on the central portion cannot cause it to invert into a reverse position of double convexity.

3.15 Neither Provent nor Brown provide any description of a structure or mechanism to achieve their required movement beyond the provision of a hinge mechanism. Indeed, as discussed above, a hinge mechanism is not the structural equivalent of the initiator portion of the present invention insofar as it does not "project away from said plane [of the flex panel] in said transverse direction" and is not confined to a "longitudinally displaced" plane parallel to the plane of the flexure region. Further, the hinge cannot provide a controlled inversion or "progressively flex" as required by the claims. Indeed, the hinge is circumferential and does not project in the same direction as the flex panel. The initiator region of the present invention causes movement in the flexure region to be parallel to the movement in the initiator region and the present claims have been amended so as to more clearly emphasise that distinction.

3.16 Turning now specifically to Krishnakumar, as mentioned previously this teaches an outward double convexity of the centre portion of its panel which for the previously cited reasons entirely different from what is taught by the present invention. Krishnakumar has novelty over Brown by it being restricted to providing a different structural alignment for its hinge mechanism. The hinge mechanism for Krishnakumar is perpendicular to the convexity as shown in its Figure 4. Krishnakumar suggests that double outward

convexity is capable of inverting and as a method for vacuum compensation. Neither Brown nor Krishnakumar teach any structure to cause such movement beyond a hinge mechanism as was first proposed by Provent. Reference again may be made to Appendices A and B.

3.17 The applicant believes that the inversion of a double convex, relatively non-elastic, plastic panel, to be impossible or even if achieved would not enable the panel to be capable of gaining their original position. The present invention specifically avoids such a double convexity and provides a claimed structure which allows for an outwardly projecting panel to flex and progressively invert under low threshold of vacuum pressure. The parallel displaced initiator portion, being less outwardly projecting, as in the present invention, will yield at low threshold and will flex inwardly. As it does, it will cause parallel and single direction movement in the smoothly adjoining flexure region.

3.18 New claims 71-80 have been added. Claims 71-76 are directed to a container having a flex panel including a first portion and a second portion, wherein the first portion and the second portion are each displaced with respect to the longitudinal axis and differentially in respect to the plane of the flex panel along that axis. These features are not taught or suggested in the cited references.

3.19 New claim 77 has been added including the longitudinal displacement of the flexure and initiator regions but further defining the flexing of those regions to be in parallel directions.

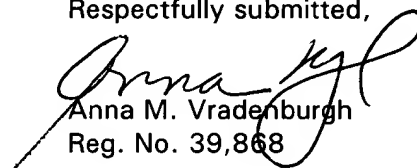
3.20 New claims 78 and 79 are dependent on claim 65 and qualify features of that claim.

3.21 New claim 80 has been added, wherein the flexure initiator region is disposed between a first flexure region and a second flexure region.

3.22 In summary therefore, the present invention as claimed, is, in the applicant's respectful submission, clearly distinguished over any teaching or suggestion in any of the citations, either alone or in combination. This submission is particularly directed towards the independent claims as now amended. However, for the same reasons it submitted the claims dependent on those independent claims are also patentably distinguished over any of the citations, either alone or in combination.

3.23 In light of the foregoing, the Applicant respectfully requests entry of the amendments set forth in the response. The Applicant believes that the claims are now in allowable form and respectfully requests that the claims be passed to allowance.

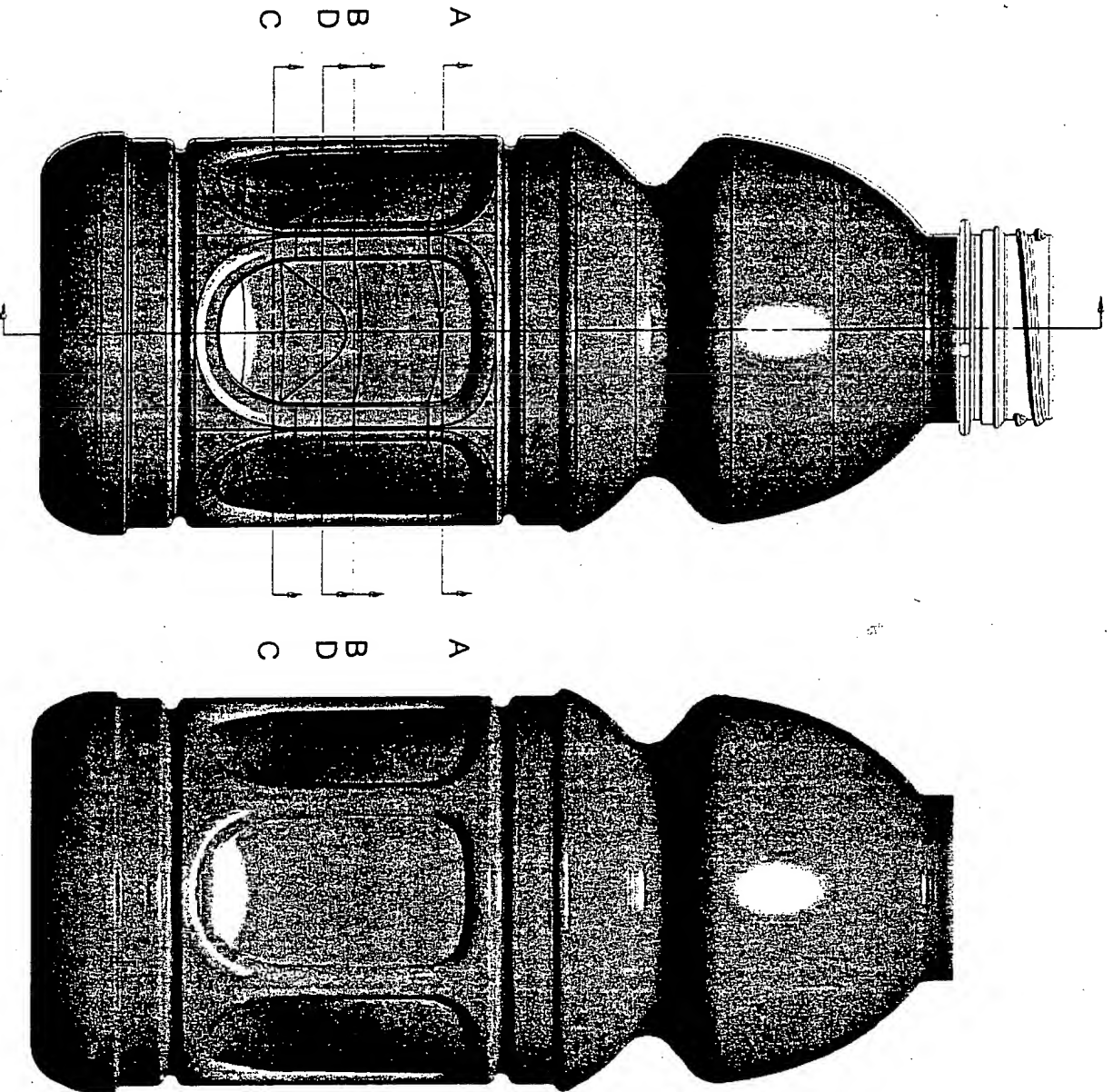
Respectfully submitted,



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Reg. No. 39,868

CONTAINER #1

A6

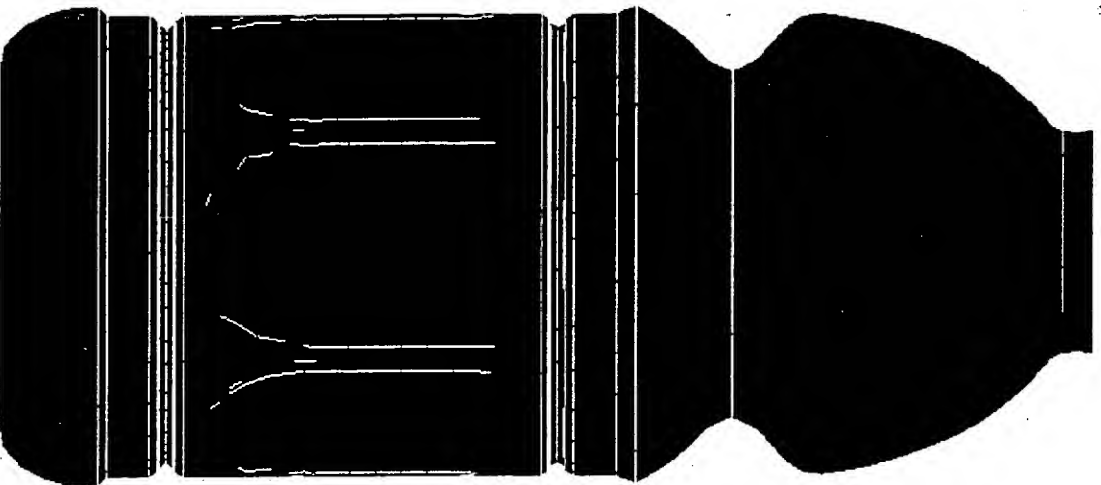


A container comprising 6 panel shapes according to the PRESENT invention.

# Pressure Step 1

## A6 Finite Element Analysis

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 Part Coordinate System



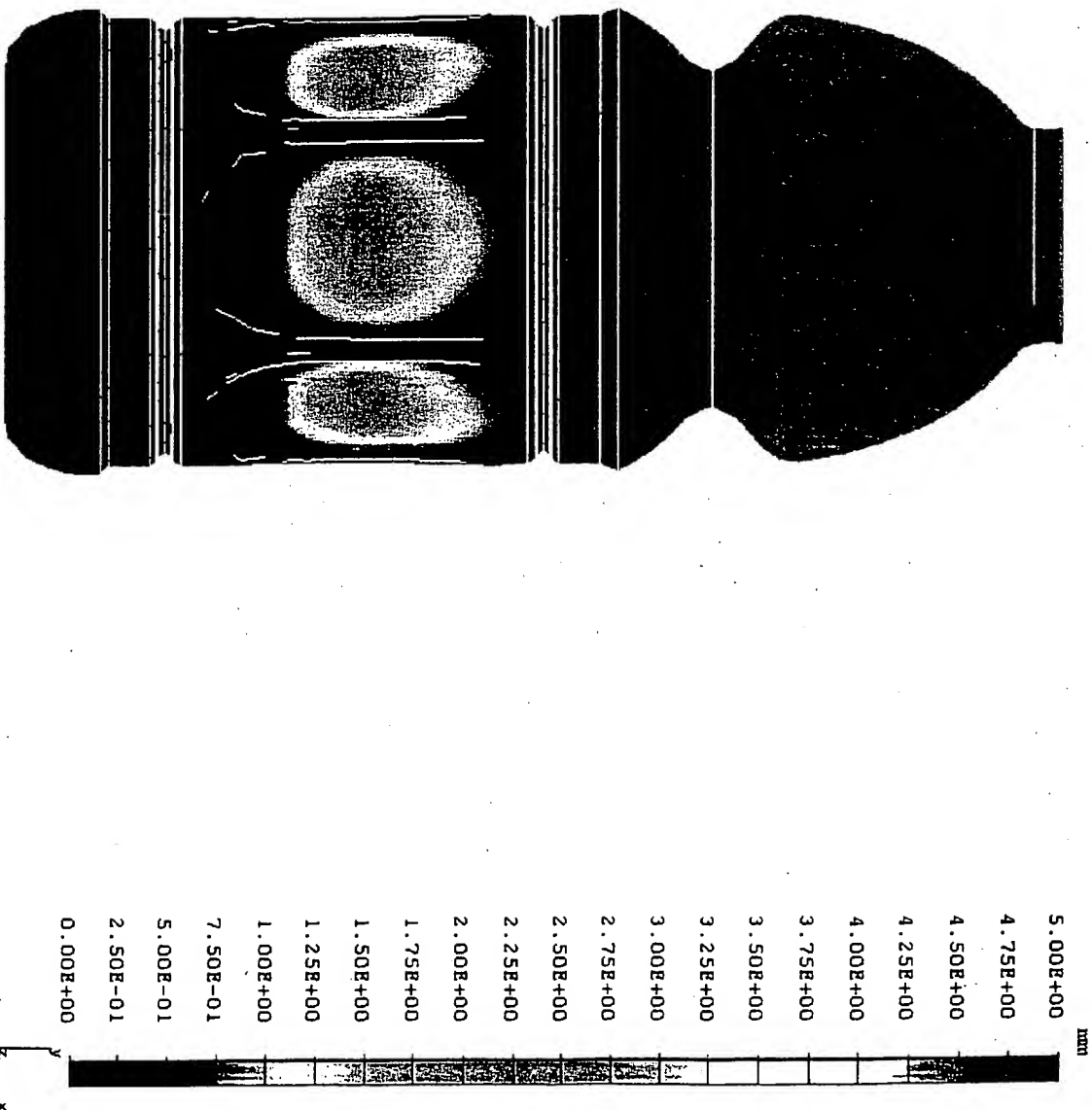
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# Pressure Step 2

## A6 Finite Element Analysis

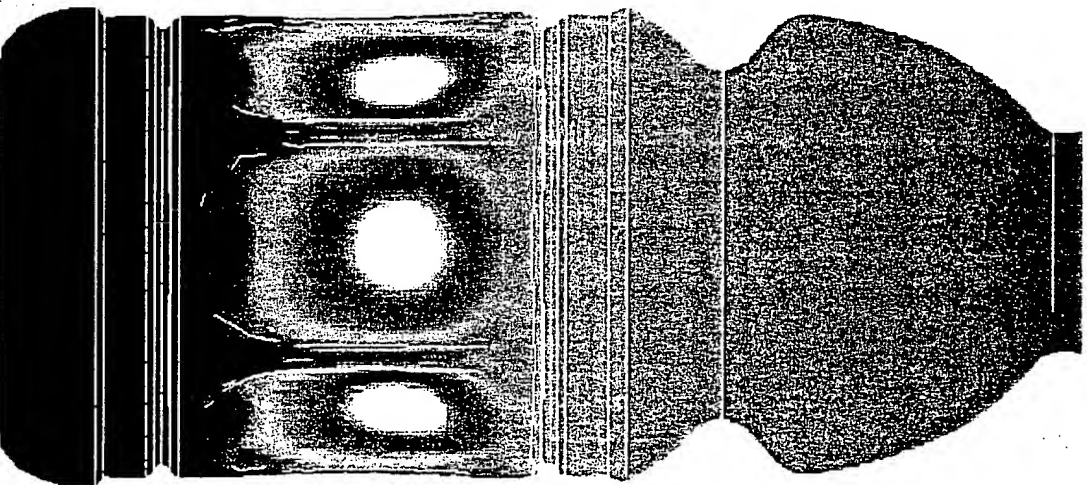
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 Part Coordinate System



# Pressure Step 3

## A6 Finite Element Analysis

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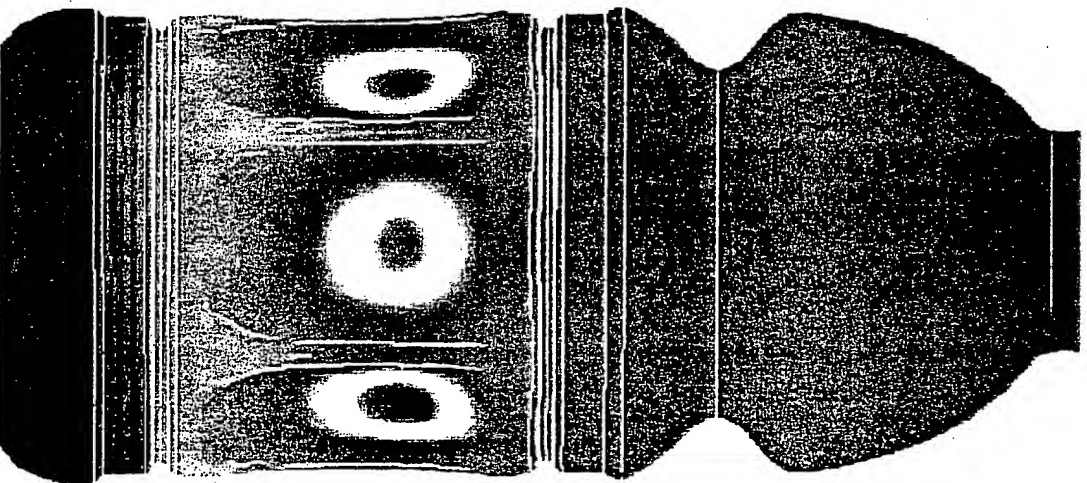
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# Pressure Step 4

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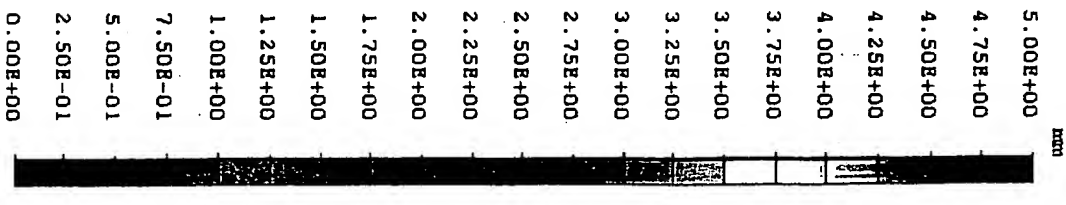
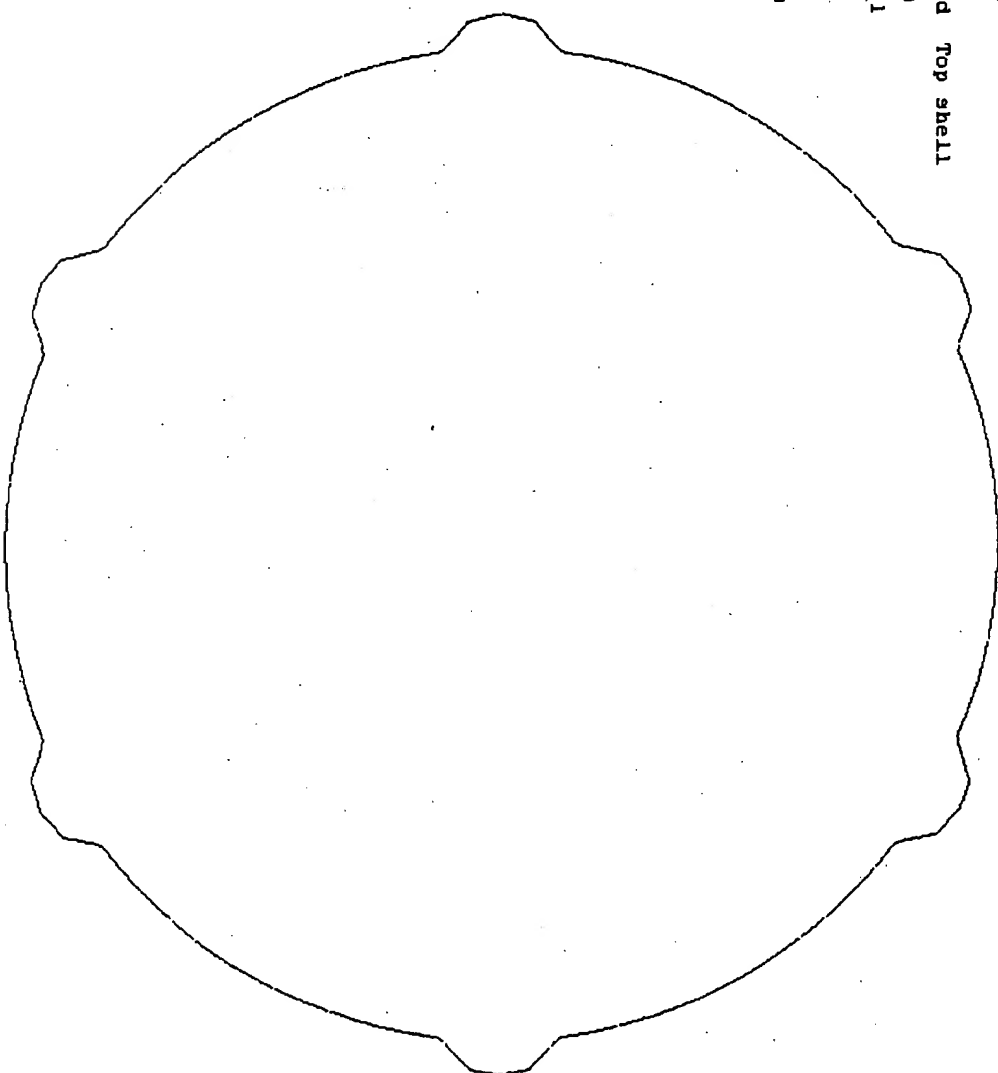


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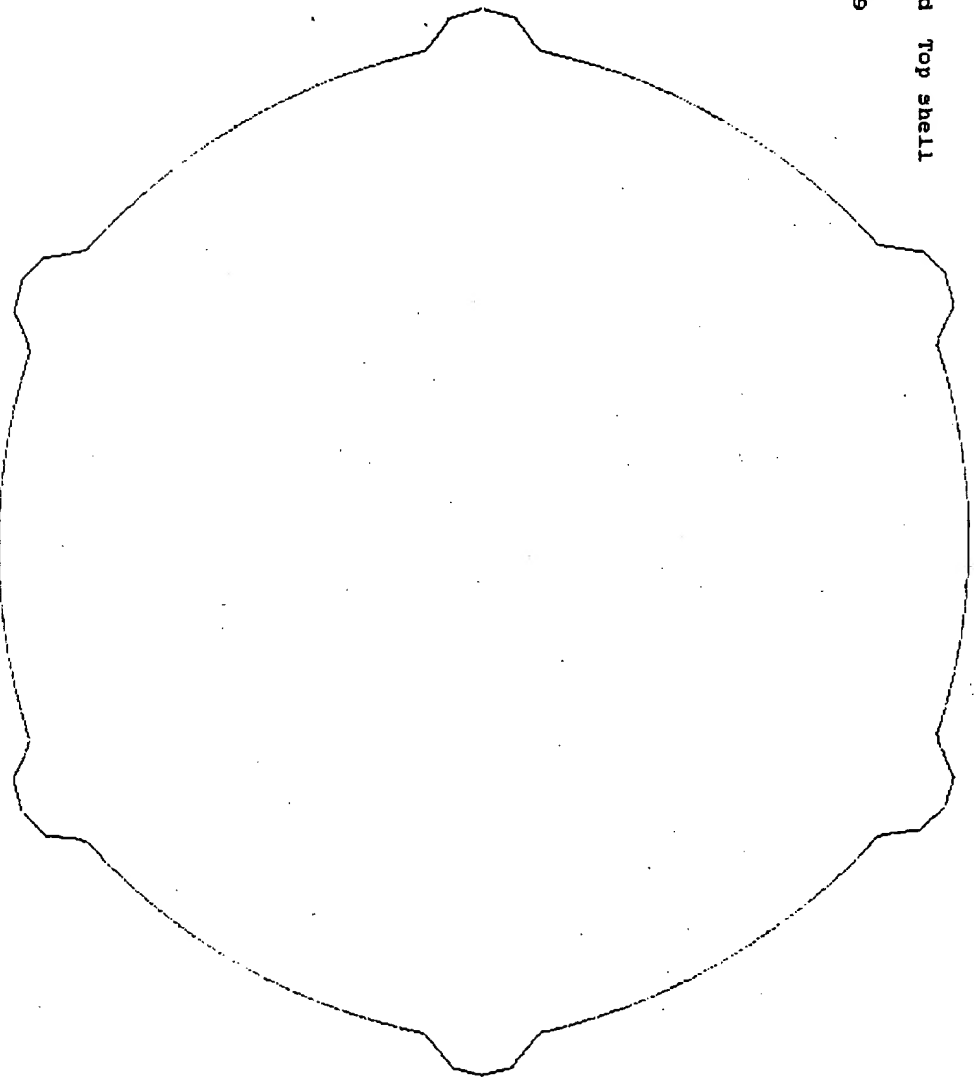


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 Part Coordinate System



SECTION A-A

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 Part Coordinate System

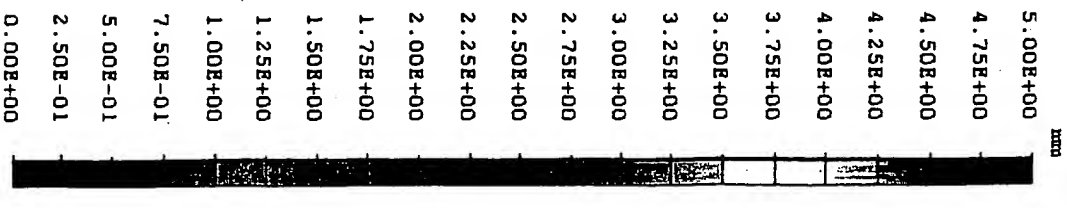
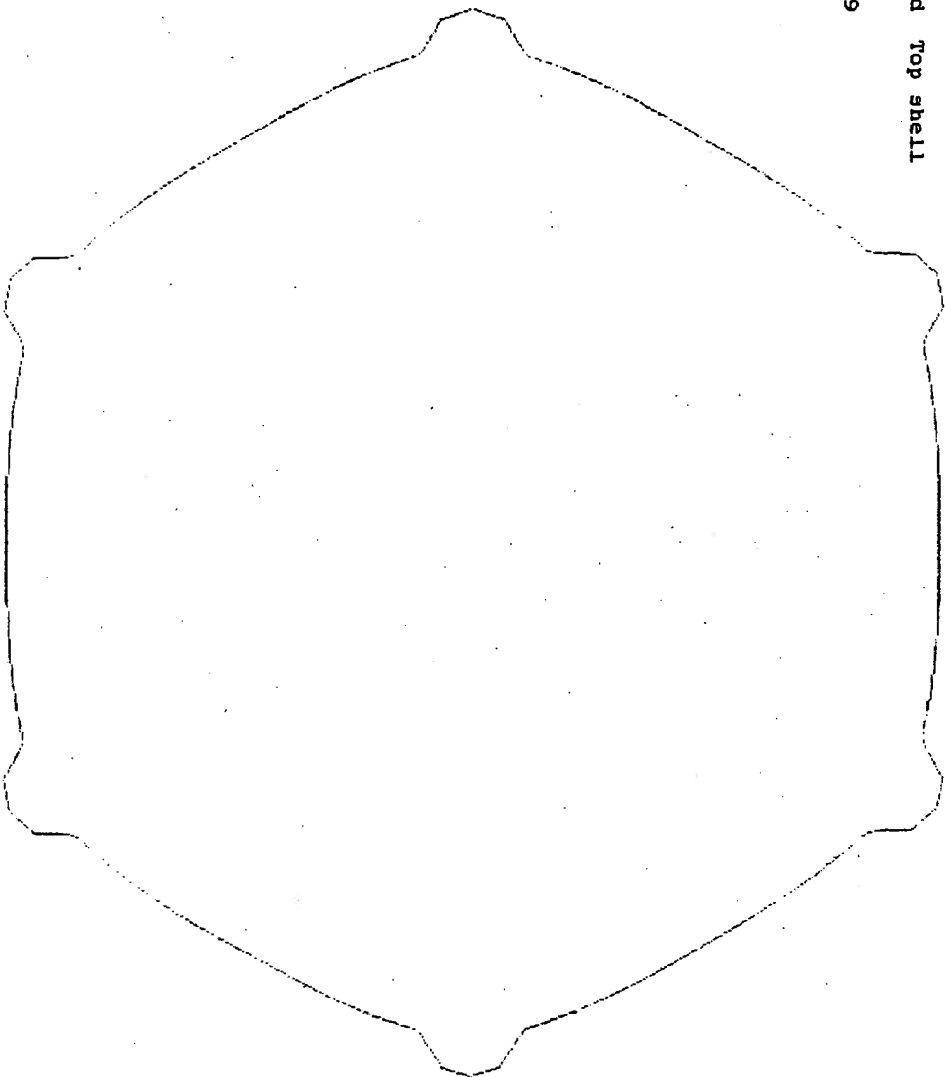


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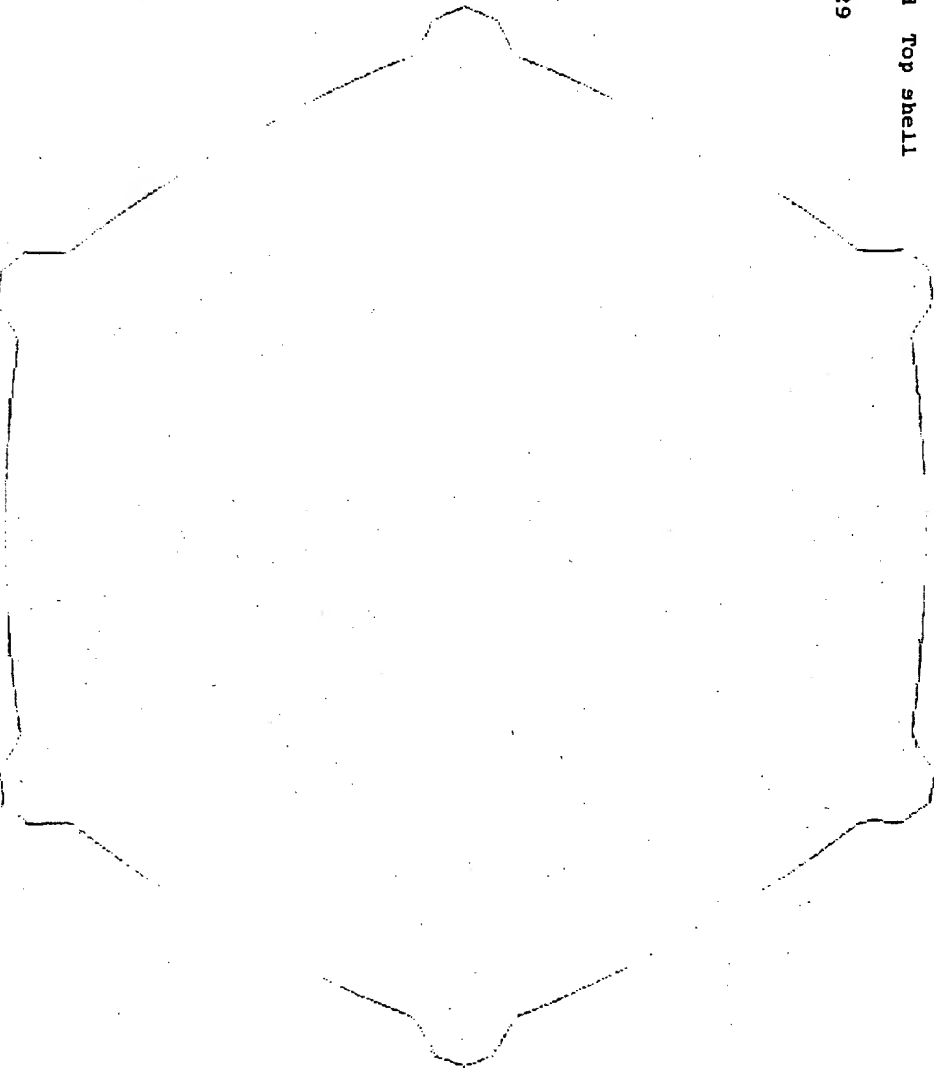


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 Part Coordinate System



SECTION A-A

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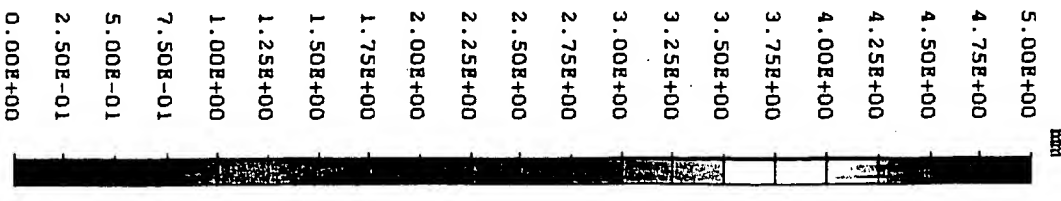
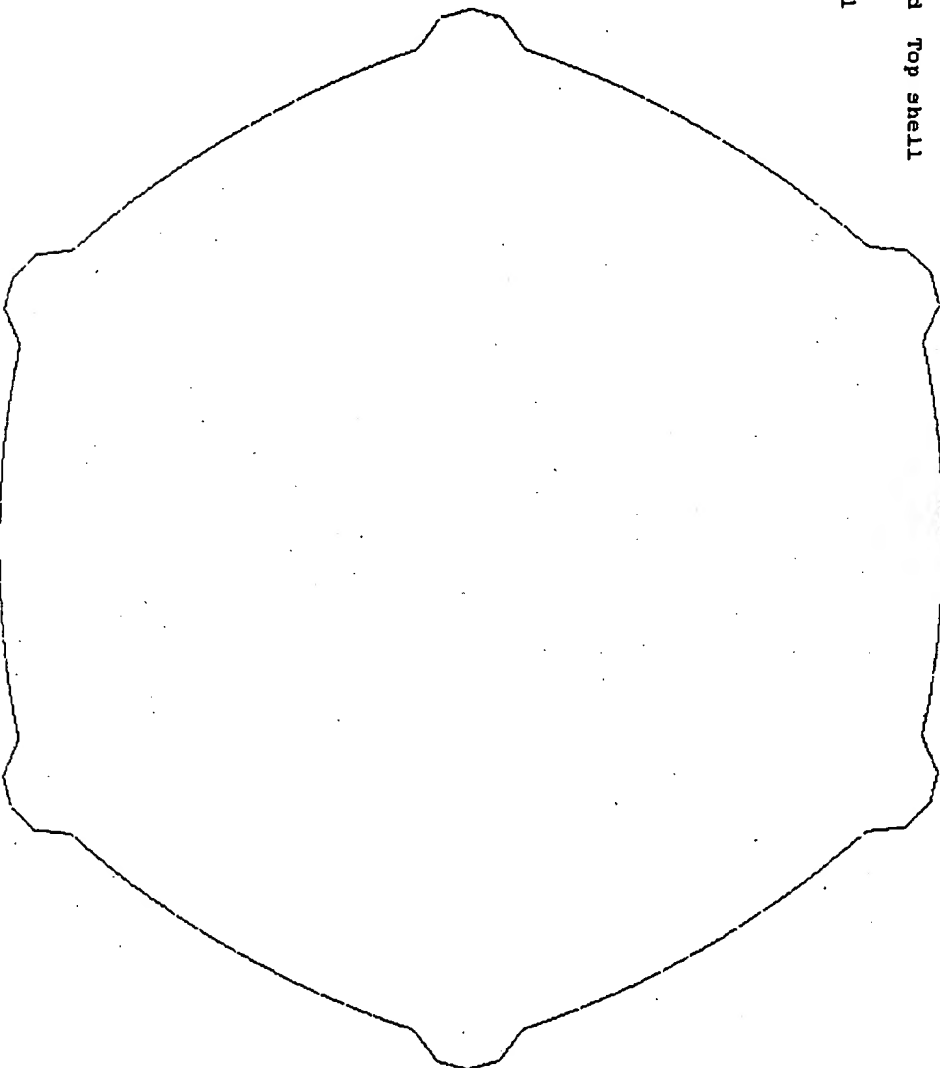
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SECTION B-B

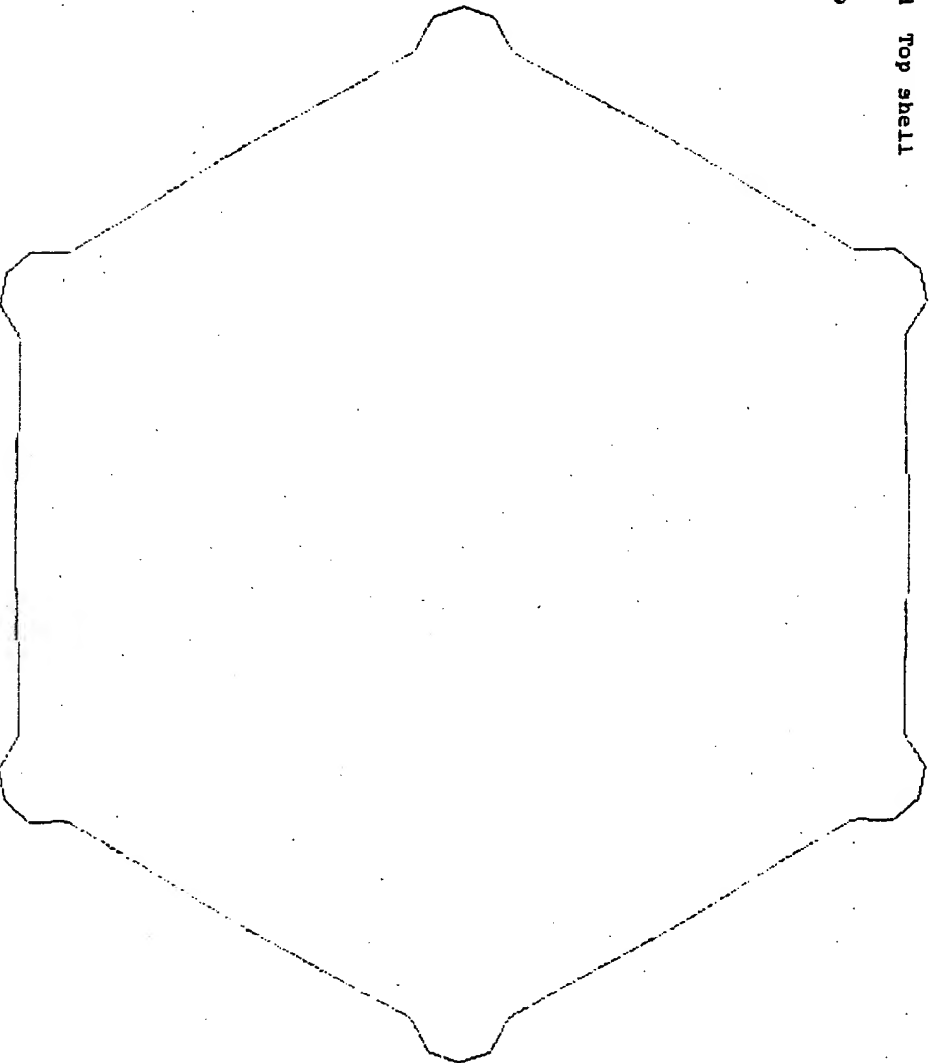
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# Pressure Step 2

## SECTION B-B

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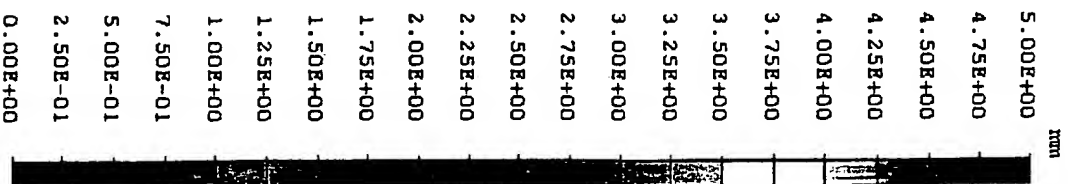
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 0.00E+00



# Pressure Step 3

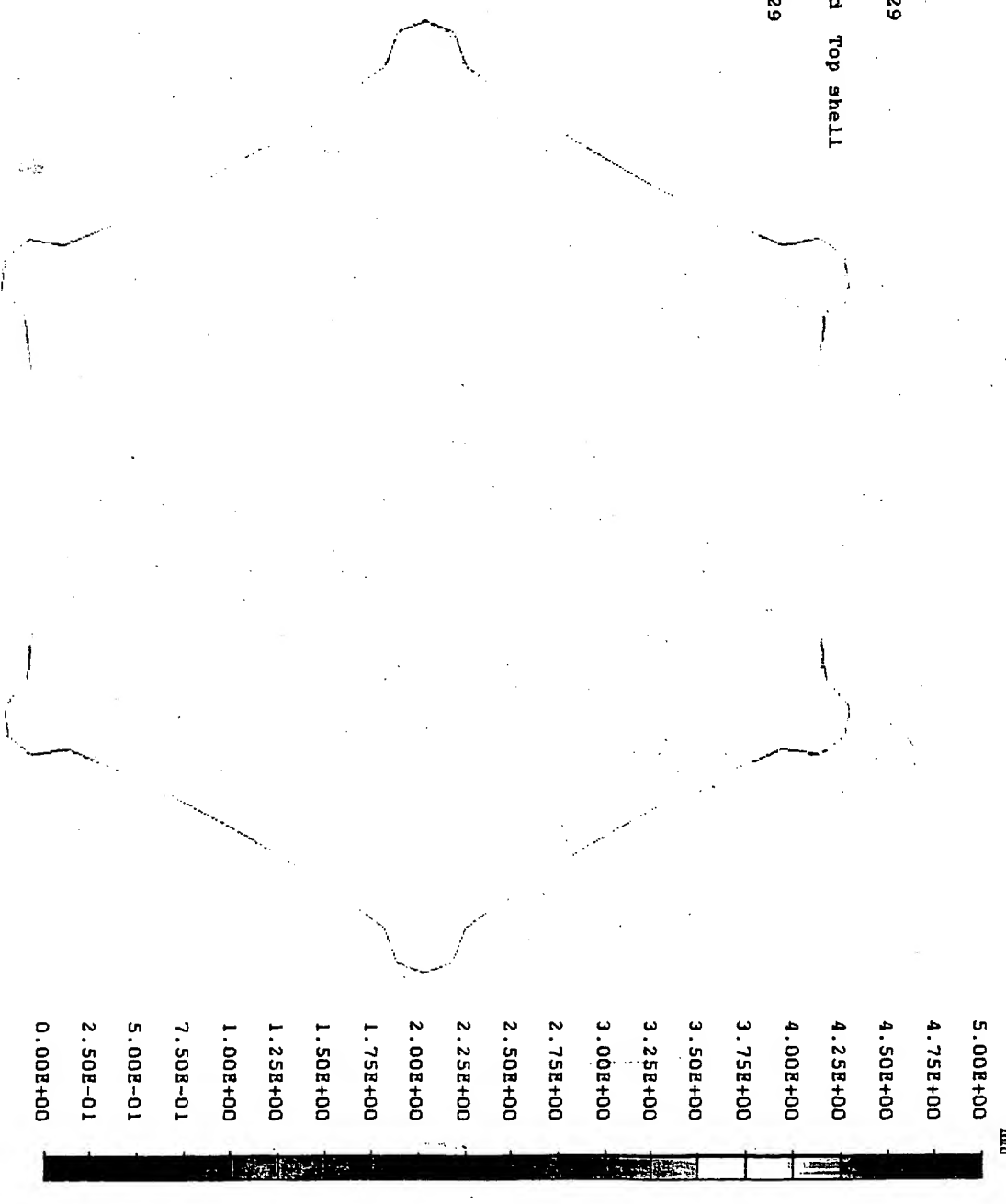
## SECTION B-B

I-DEAS Visualizer  
 Display 1  
 China\_Gacorade\_Patent\_Drawing  
 B.C. 1, TIME = 0.5, DISPLACEMENT\_19  
 d:\user\Chinagace.mfl  
 DISPLACEMENT Magnitude Unaveraged Top shell  
 Min: 6.13E-01 mm Max: 3.47E+00 mm  
 B.C. 1, TIME = 0.5, DISPLACEMENT\_19  
 d:\user\Chinagace.mfl  
 DISPLACEMENT XYZ Magnitude  
 Min: 8.13E-01 mm Max: 3.47E+00 mm  
 Part Coordinate System



SECTION B-B

I-DEAS Visualizer  
 Display 1  
 China\_Gatorade\_Patent\_Drawing  
 B.C. 1, TIME = 0.75, DISPLACEMENT\_29  
 d:\user\Chinegate.mfl  
 DISPLACEMENT Magnitude Unaveraged Top shell  
 Min: 1.38E+00 mm Max: 4.35E+00 mm  
 B.C. 1, TIME = 0.75, DISPLACEMENT\_29  
 d:\user\Chinegate.mfl  
 DISPLACEMENT XYZ Magnitude  
 Min: 1.38E+00 mm Max: 4.35E+00 mm  
 Part Coordinate System



5.00E+00  
 4.75E+00  
 4.50E+00  
 4.25E+00  
 4.00E+00  
 3.75E+00  
 3.50E+00  
 3.25E+00  
 3.00E+00  
 2.75E+00  
 2.50E+00  
 2.25E+00  
 2.00E+00  
 1.75E+00  
 1.50E+00  
 1.25E+00  
 1.00E+00  
 7.50E-01  
 5.00E-01  
 2.50E-01  
 0.00E+00



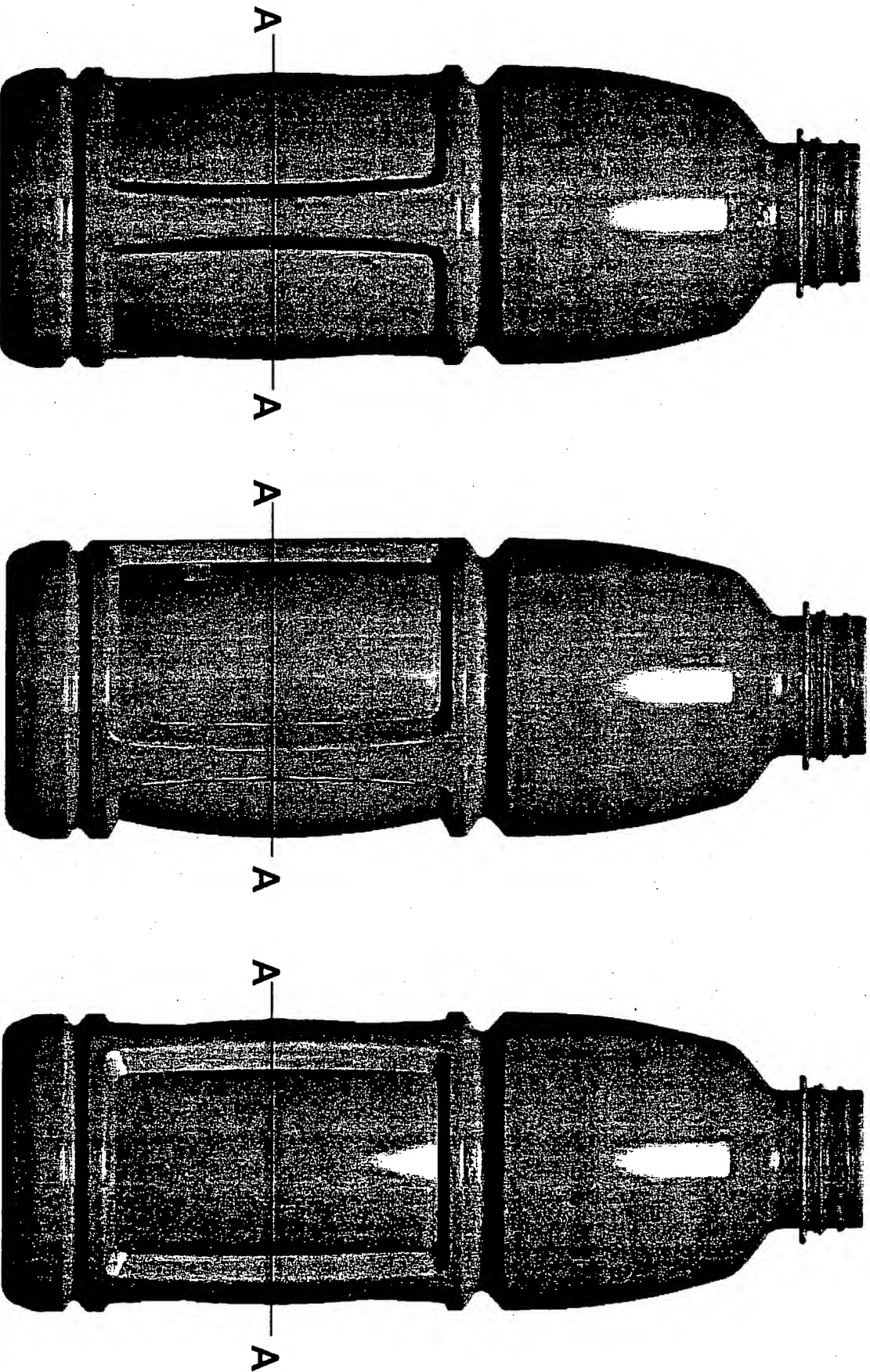


Serial No: 09/689,

## **APPENDIX B - Container 3 (BPK Panel) FEA**

**BPK3 Finite Element Analysis**

Container **BPK3** – A container comprising 3 panel shapes according to the Brown and Provent and Krishnakumar inventions.

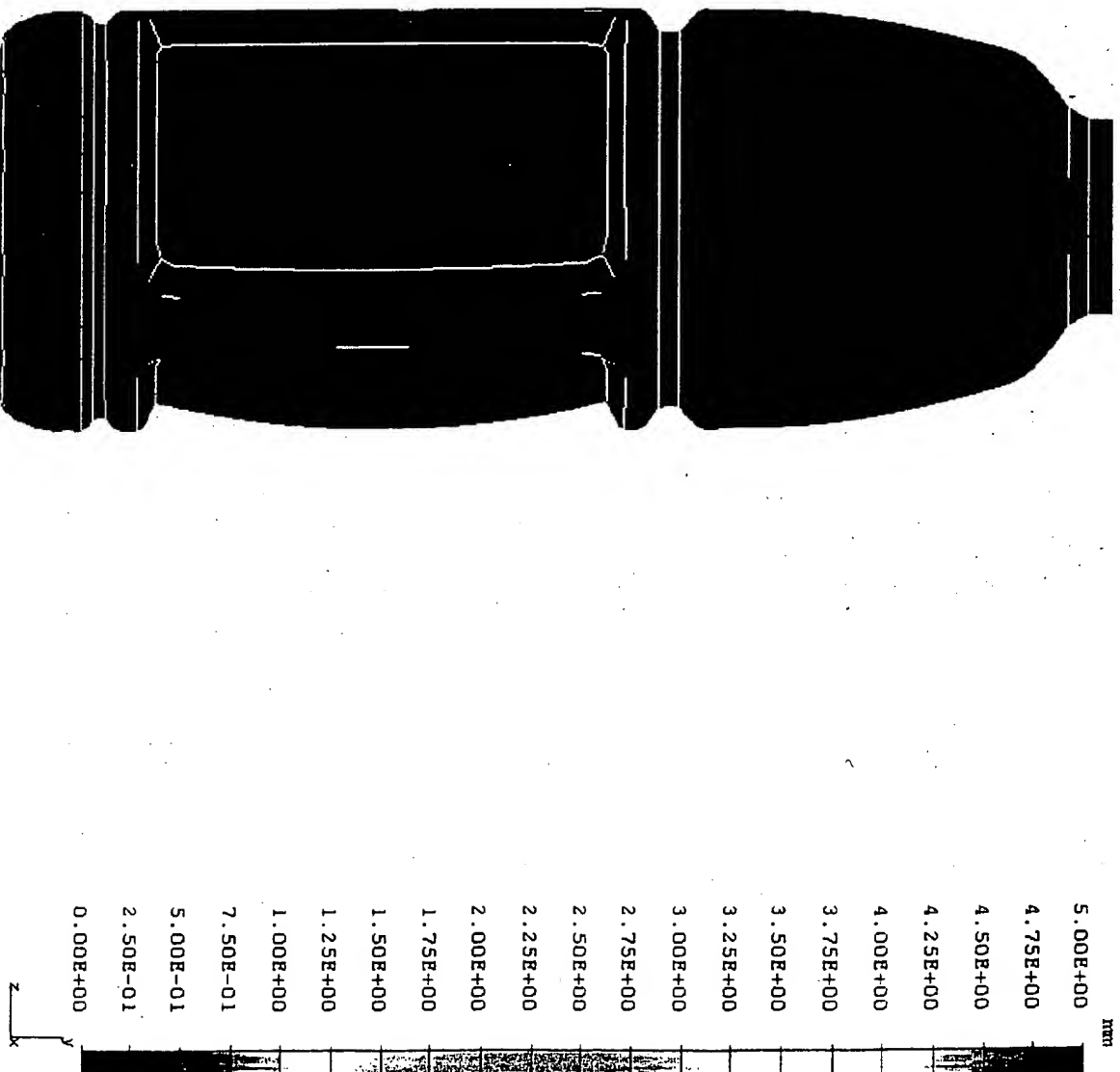


# Pressure Step 1

## BPK3 Finite Element Analysis

```

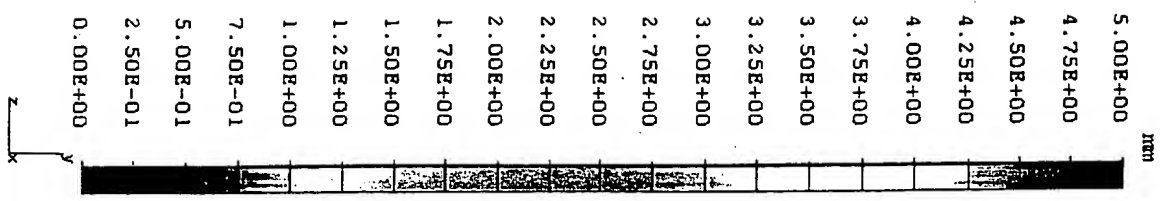
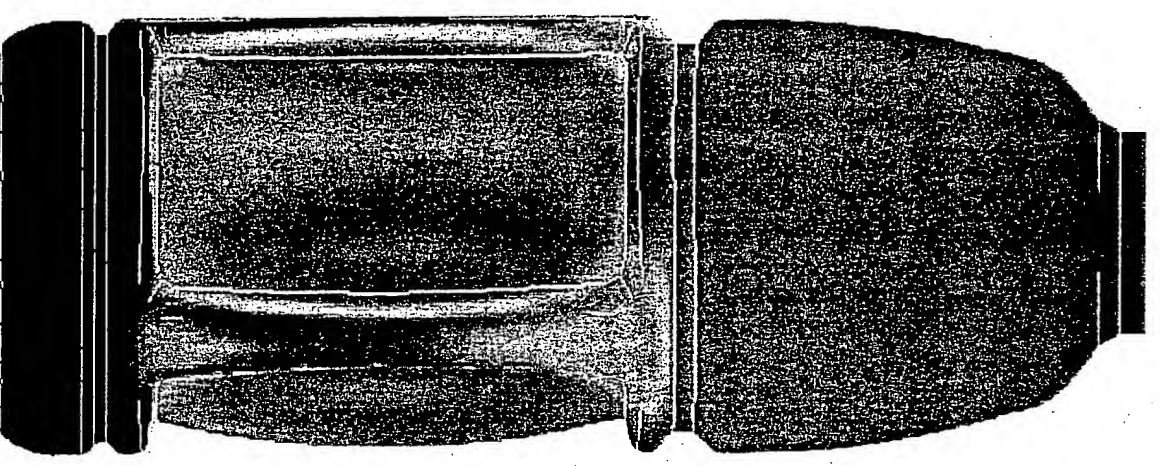
3panel_plain_V15
B.C. 1, TIME = 0.05, DISPLACEMENT_1
d:\user\work_19_03_03.mf1
PRESSURE2.5 PSI
DISPLACEMENT Magnitude Unaveraged Top shell
Min: 0.00E+00 mm Max: 4.72E-01 mm
B.C. 1, TIME = 0.05, DISPLACEMENT_1
d:\user\work_19_03_03.mf1
DISPLACEMENT XYZ Magnitude
Min: 0.00E+00 mm Max: 4.72E-01 mm
Part Coordinate System
    
```



Pressure Step 2

BPK3 Finite Element Analysis

3panel\_Plain\_VIS  
B.C. 1, TIME = 0.3, DISPLACEMENT\_11  
d:\user\work\_19\_03\_03.mf1  
PRESSURE2.5 PSI  
DISPLACEMENT Magnitude Unaveraged Top shell  
Min: 0.00E+00 mm Max: 2.87E+00 mm  
B.C. 1, TIME = 0.3, DISPLACEMENT\_11  
d:\user\work\_19\_03\_03.mf1  
DISPLACEMENT XYZ Magnitude  
Min: 0.00E+00 mm Max: 2.87E+00 mm  
Part Coordinate System

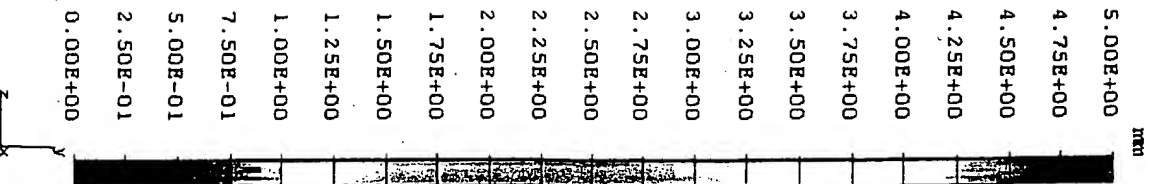
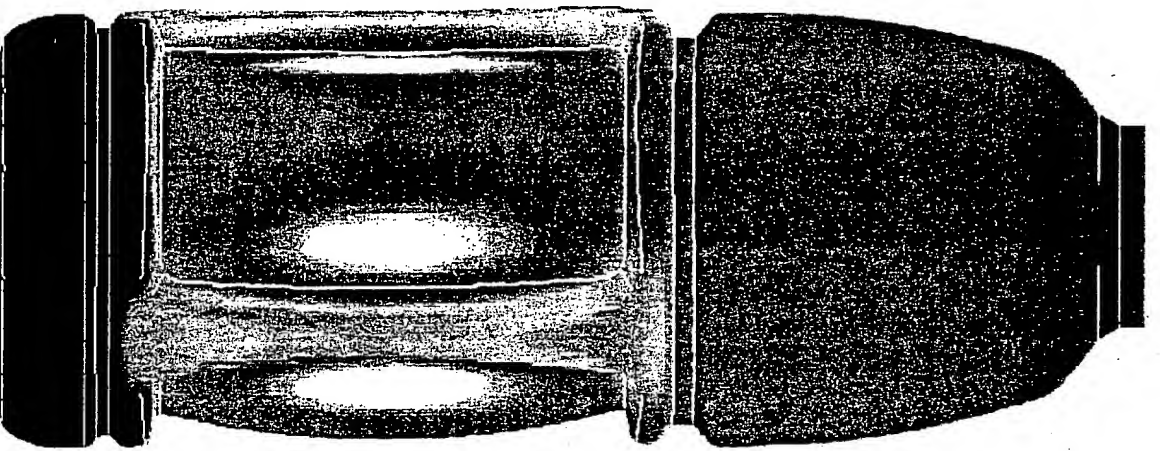


# Pressure Step 3

## BPK3 Finite Element Analysis

```

3panel_Plain_VIS
B.C. 1, TIME = 0.35, DISPLACEMENT_13
d:\user\work_19_03_03.mf1
PRESSURE2.5 PSI
DISPLACEMENT Magnitude Unaveraged Top shell
Min: 0.00E+00 mm Max: 3.52E+00 mm
B.C. 1, TIME = 0.35, DISPLACEMENT_13
d:\user\work_19_03_03.mf1
DISPLACEMENT XYZ Magnitude
Min: 0.00E+00 mm Max: 3.52E+00 mm
Part Coordinate System
    
```

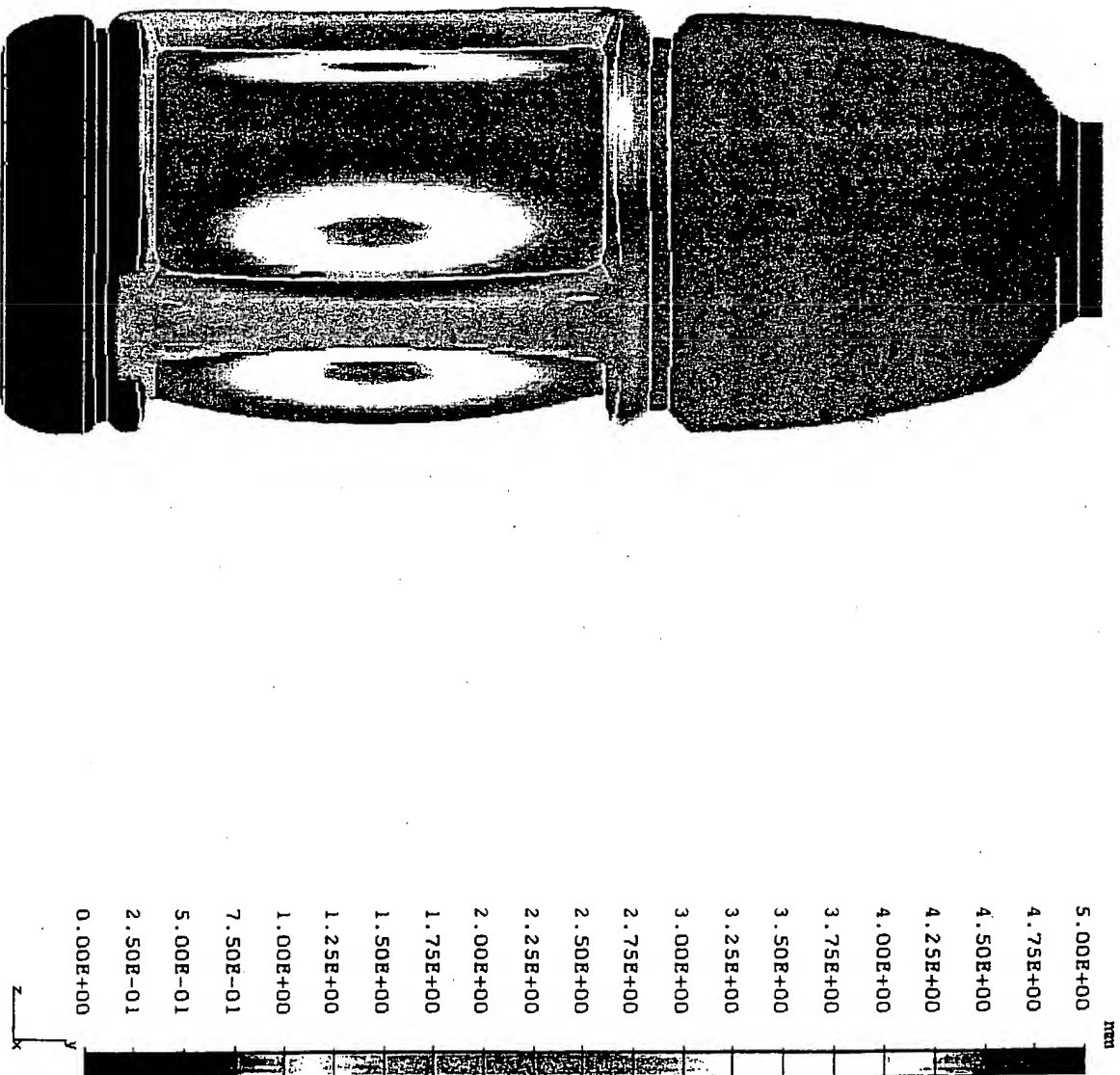


# Pressure Step 4

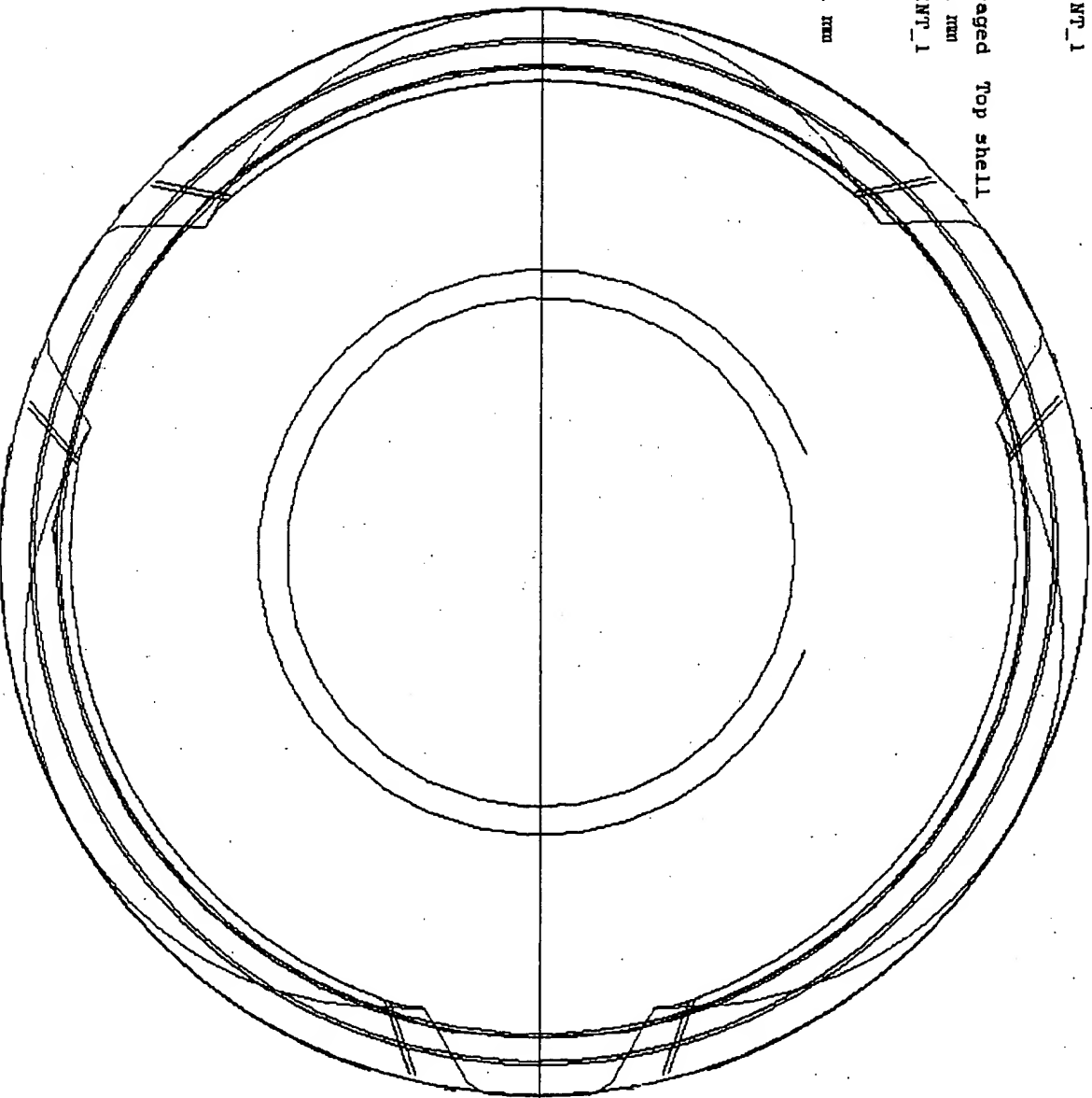
## BPK3 Finite Element Analysis

```

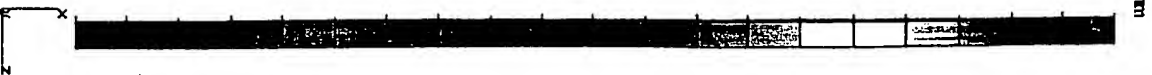
3panel_Plain_VIS
B.C. 1, TIME = 0.4, DISPLACEMENT_15
d:\user\work_19_03_03.mf1
PRESSURE2.5 PSI
DISPLACEMENT Magnitude Unaveraged Top shell
Min: 0.00E+00 mm Max: 4.36E+00 mm
B.C. 1, TIME = 0.4, DISPLACEMENT_15
d:\user\work_19_03_03.mf1
DISPLACEMENT XYZ Magnitude
Min: 0.00E+00 mm Max: 4.36E+00 mm
Part Coordinate System
    
```



3panel\_Plain\_VIS  
 B.C. 1, TIME = 0.05, DISPLACEMENT\_1  
 d:\user\work\_19\_03\_03.mf1  
 PRESSURE2.5 PSI  
 DISPLACEMENT Magnitude Unaveraged Top shell  
 Min: 0.00E+00 mm Max: 4.72E-01 mm  
 B.C. 1, TIME = 0.05, DISPLACEMENT\_1  
 d:\user\work\_19\_03\_03.mf1  
 DISPLACEMENT XYZ Magnitude  
 Min: 0.00E+00 mm Max: 4.72E-01 mm  
 Part Coordinate System



5.00E+00  
 4.75E+00  
 4.50E+00  
 4.25E+00  
 4.00E+00  
 3.75E+00  
 3.50E+00  
 3.25E+00  
 3.00E+00  
 2.75E+00  
 2.50E+00  
 2.25E+00  
 2.00E+00  
 1.75E+00  
 1.50E+00  
 1.25E+00  
 1.00E+00  
 7.50E-01  
 5.00E-01  
 2.50E-01  
 0.00E+00

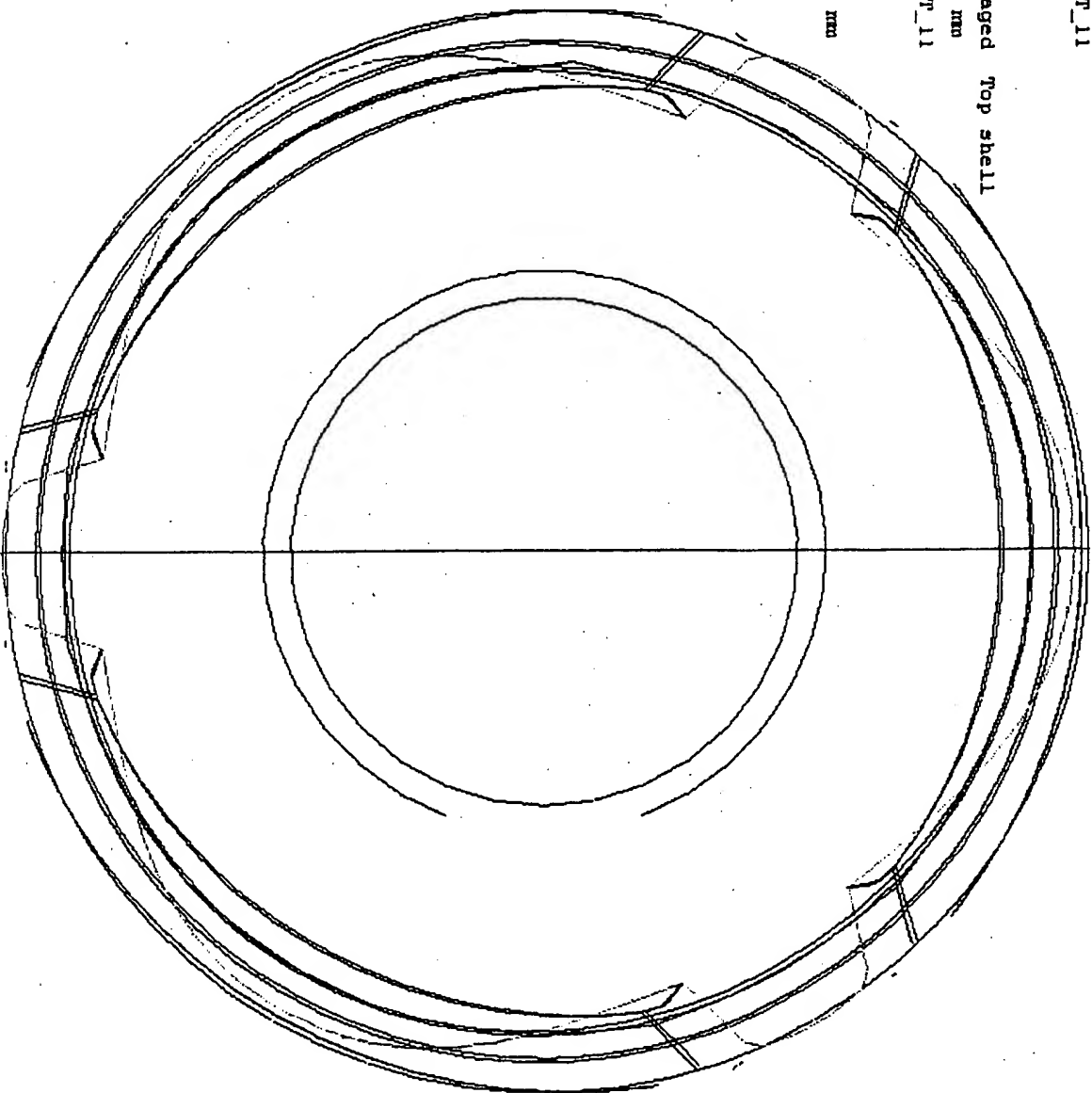


# Pressure Step 2

## SECTION A-A

## BPK3 Finite Element Analysis

3panel\_Plain\_V15  
 B.C. 1, TIME = 0.3, DISPLACEMENT\_11  
 d:\user\work\_19\_03\_03.mf1  
 PRESSURE2.5 PSI  
 DISPLACEMENT Magnitude Unaveraged Top shell  
 Min: 0.00E+00 mm Max: 2.87E+00 mm  
 B.C. 1, TIME = 0.3, DISPLACEMENT\_11  
 d:\user\work\_19\_03\_03.mf1  
 DISPLACEMENT XYZ Magnitude  
 Min: 0.00E+00 mm Max: 2.87E+00 mm  
 Part Coordinate System

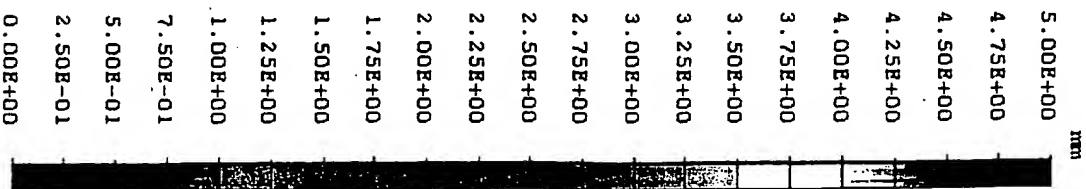
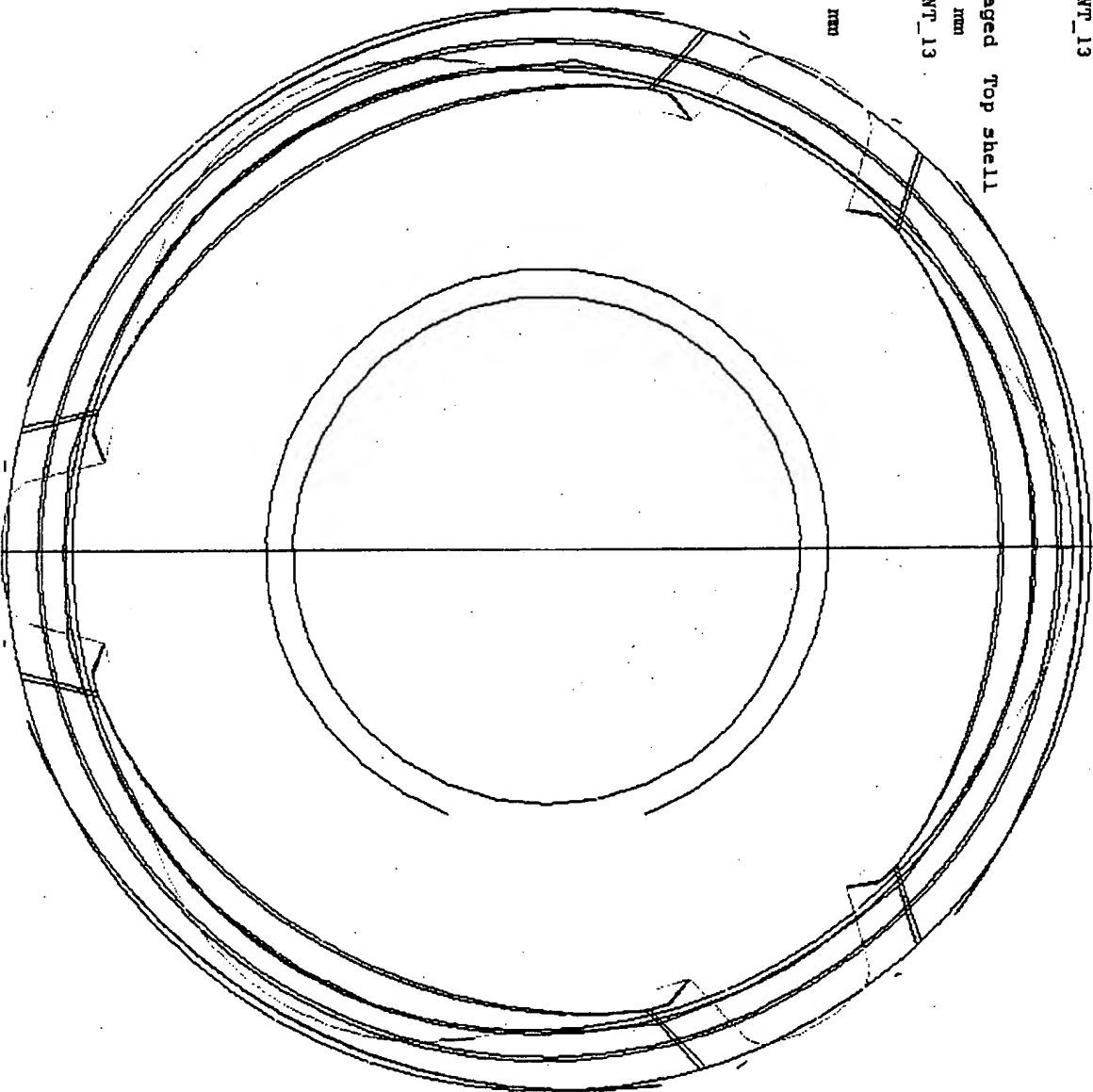


5.00E+00  
 4.75E+00  
 4.50E+00  
 4.25E+00  
 4.00E+00  
 3.75E+00  
 3.50E+00  
 3.25E+00  
 3.00E+00  
 2.75E+00  
 2.50E+00  
 2.25E+00  
 2.00E+00  
 1.75E+00  
 1.50E+00  
 1.25E+00  
 1.00E+00  
 7.50E-01  
 5.00E-01  
 2.50E-01  
 0.00E+00

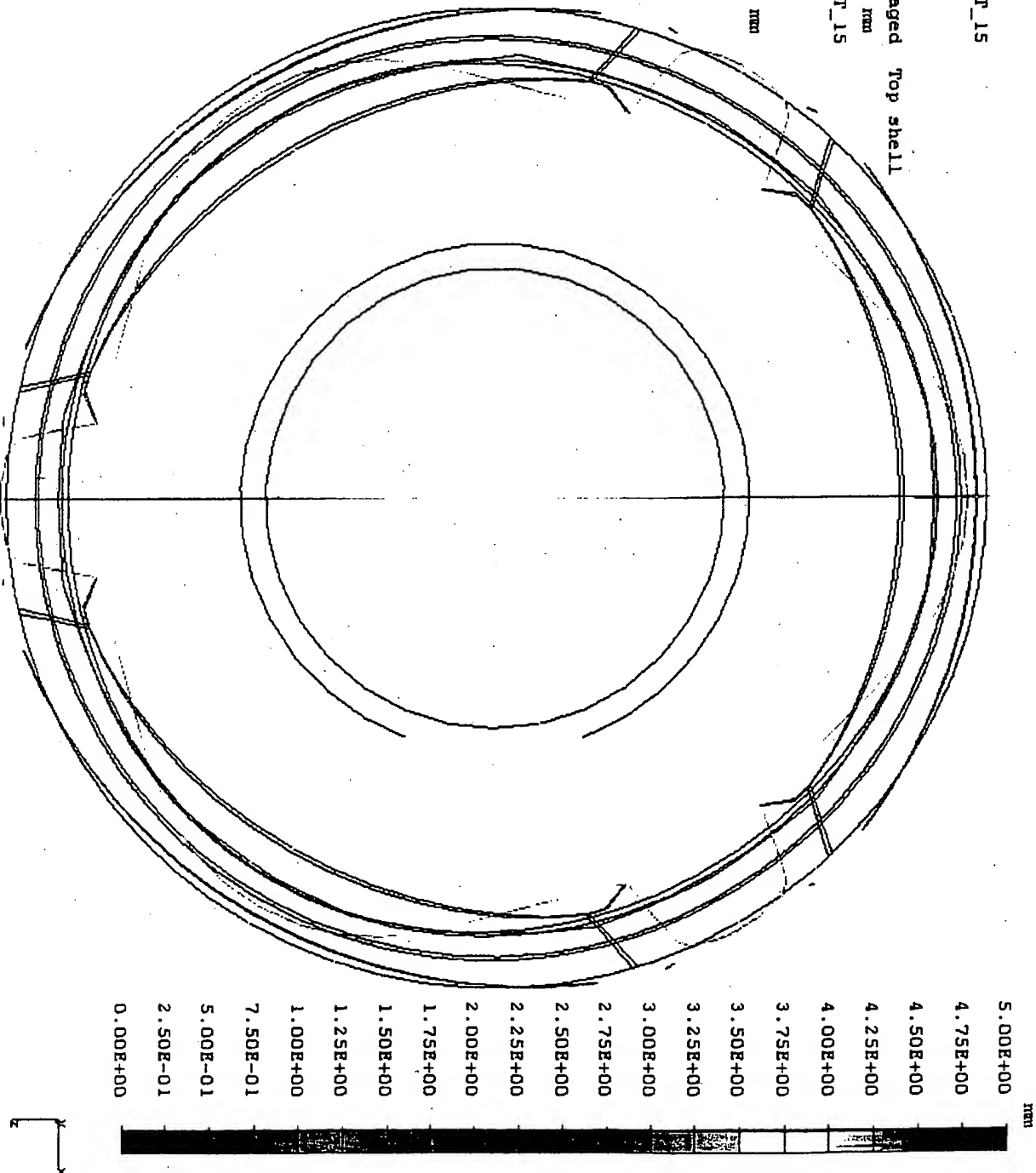




3panel\_plain\_V15  
 B.C. 1, TIME = 0.35, DISPLACEMENT\_13  
 d:\user\work\_19\_03\_03.mf1  
 PRESSURE 2.5 PSI  
 DISPLACEMENT Magnitude Unaveraged Top shell  
 Min: 0.00E+00 mm Max: 3.51E+00 mm  
 B.C. 1, TIME = 0.35, DISPLACEMENT\_13  
 d:\user\work\_19\_03\_03.mf1  
 DISPLACEMENT XYZ Magnitude  
 Min: 0.00E+00 mm Max: 3.51E+00 mm  
 Part Coordinate System

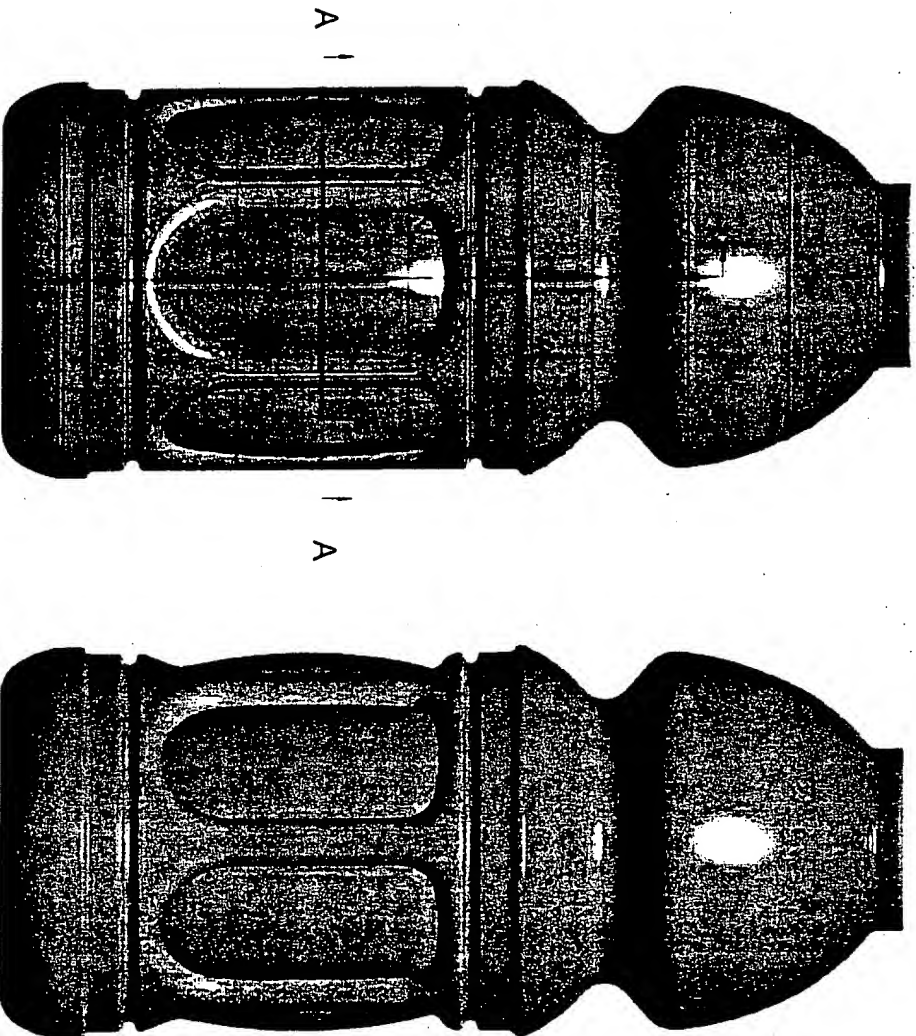


3panel\_plain\_VIS  
 B.C. 1, TIME = 0.4, DISPLACEMENT\_15  
 d:\user\work\_19\_03\_03.mf1  
 PRESSURE2.5 PSI  
 DISPLACEMENT Magnitude Unaveraged Top shell  
 Min: 0.00E+00 mm Max: 4.35E+00 mm  
 B.C. 1, TIME = 0.4, DISPLACEMENT\_15  
 d:\user\work\_19\_03\_03.mf1  
 DISPLACEMENT XYZ Magnitude  
 Min: 0.00E+00 mm Max: 4.35E+00 mm  
 Part Coordinate System



**BPK6 Finite Element Analysis**

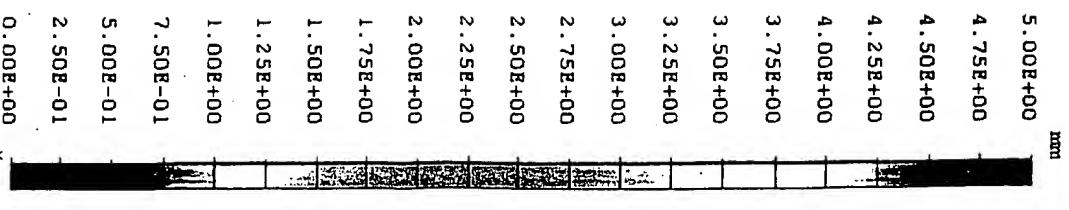
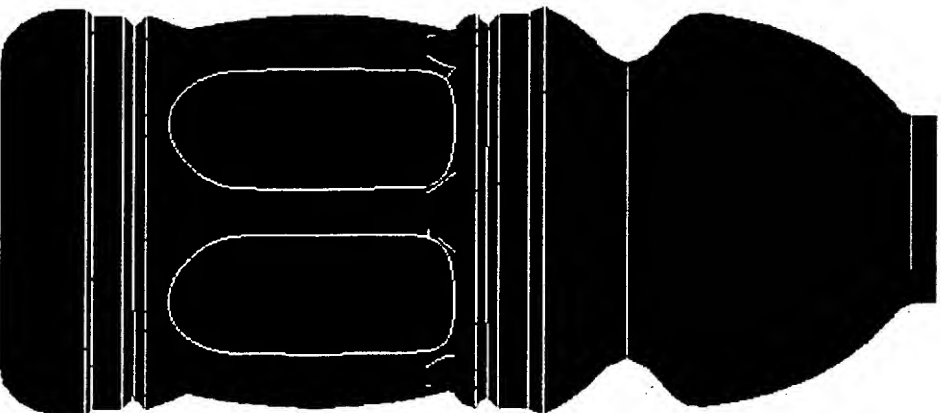
Container **BPK6** – A container comprising 6 panel shapes according to the Brown and Provent and Krishnakumar inventions.



**Figure BPK6-1**

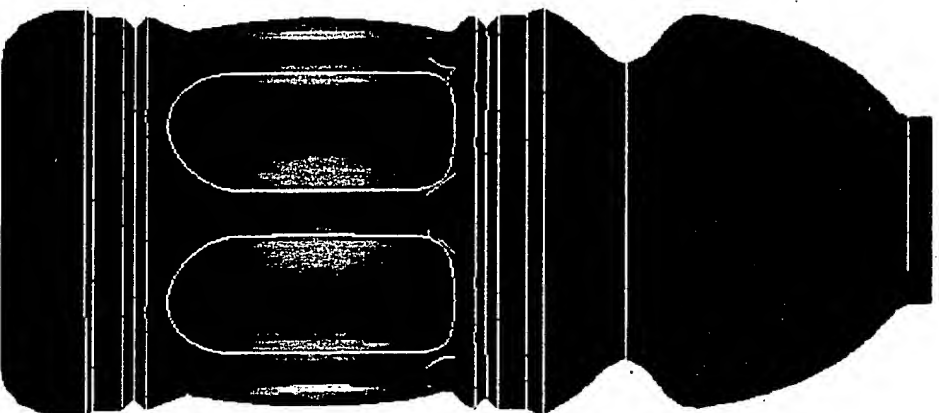
```

I-DEAS Visualizer
Display 1
China_Gatcorade_Patent_Doubly_Convex
B.C. 1, TIME = 0.05, DISPLACEMENT_1
d:\user\Chinagate.mfl
DISPLACEMENT Magnitude Unaveraged Top shell
Min: 0.00E+00 mm Max: 4.02E-01 mm
B.C. 1, TIME = 0.05, DISPLACEMENT_1
d:\user\Chinagate.mfl
DISPLACEMENT XYZ Magnitude
Min: 0.00E+00 mm Max: 4.02E-01 mm
Part Coordinate System
    
```



```

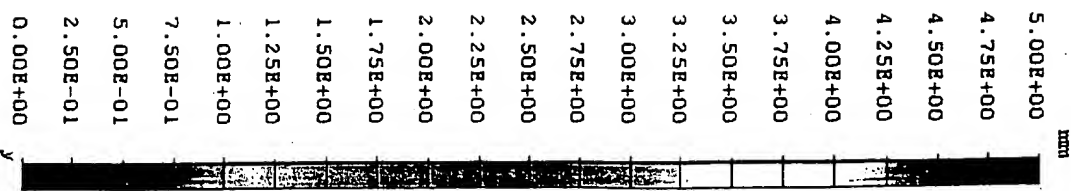
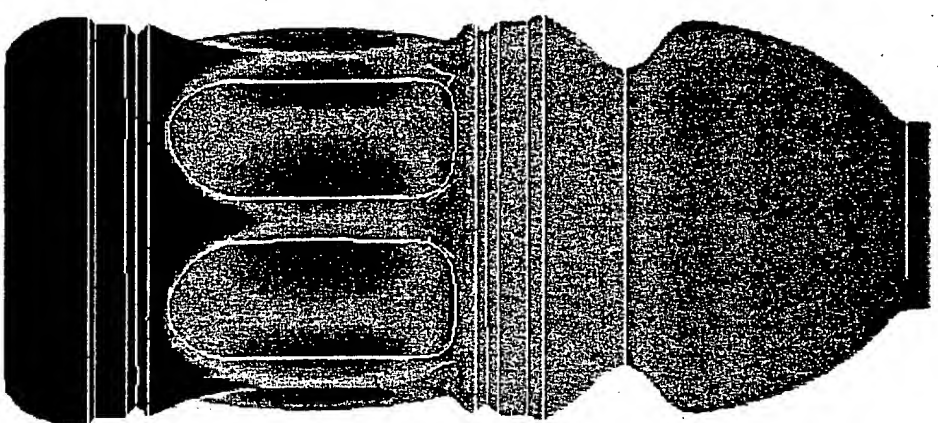
I-DEAS Visualizer
Display 1
China_Gatcorade_Patent_Doubly_Convex
B.C. 1, TIME = 0.25, DISPLACEMENT_9
d:\user\Chinagate.mfl
DISPLACEMENT Magnitude Unaveraged Top shell
Min: 0.00E+00 mm Max: 1.28E+00 mm
B.C. 1, TIME = 0.25, DISPLACEMENT_9
d:\user\Chinagate.mfl
DISPLACEMENT XYZ Magnitude
Min: 0.00E+00 mm Max: 1.28E+00 mm
Part Coordinate System
    
```



mm

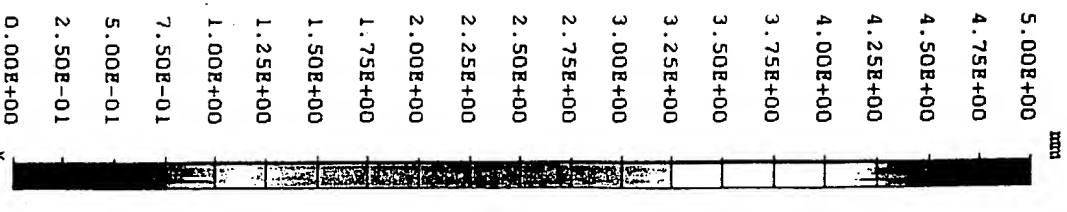
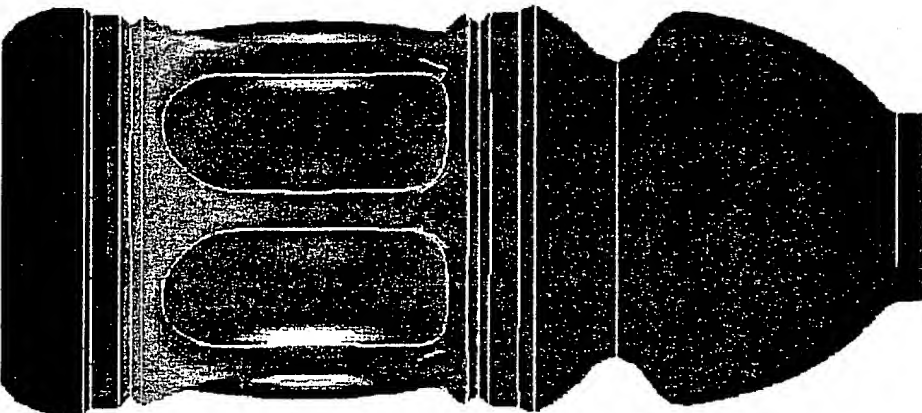
5.00E+00
4.75E+00
4.50E+00
4.25E+00
4.00E+00
3.75E+00
3.50E+00
3.25E+00
3.00E+00
2.75E+00
2.50E+00
2.25E+00
2.00E+00
1.75E+00
1.50E+00
1.25E+00
1.00E+00
7.50E-01
5.00E-01
2.50E-01
0.00E+00

I-DEAS Visualizer  
 Display 1  
 China\_Gacorade\_Patent\_Doubly\_Convex  
 B.C. 1, TIME = 0.5, DISPLACEMENT\_19  
 d:\user\Chinagate.mfl  
 DISPLACEMENT Magnitude Unaveraged Top shell  
 Min: 0.00E+00 mm Max: 2.23E+00 mm  
 B.C. 1, TIME = 0.5, DISPLACEMENT\_19  
 d:\user\Chinagate.mfl  
 DISPLACEMENT XYZ Magnitude  
 Min: 0.00E+00 mm Max: 2.23E+00 mm  
 Part Coordinate System

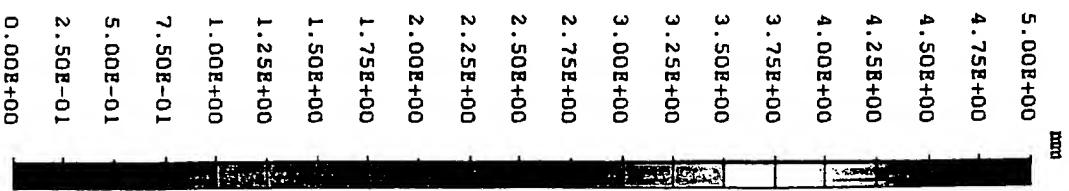
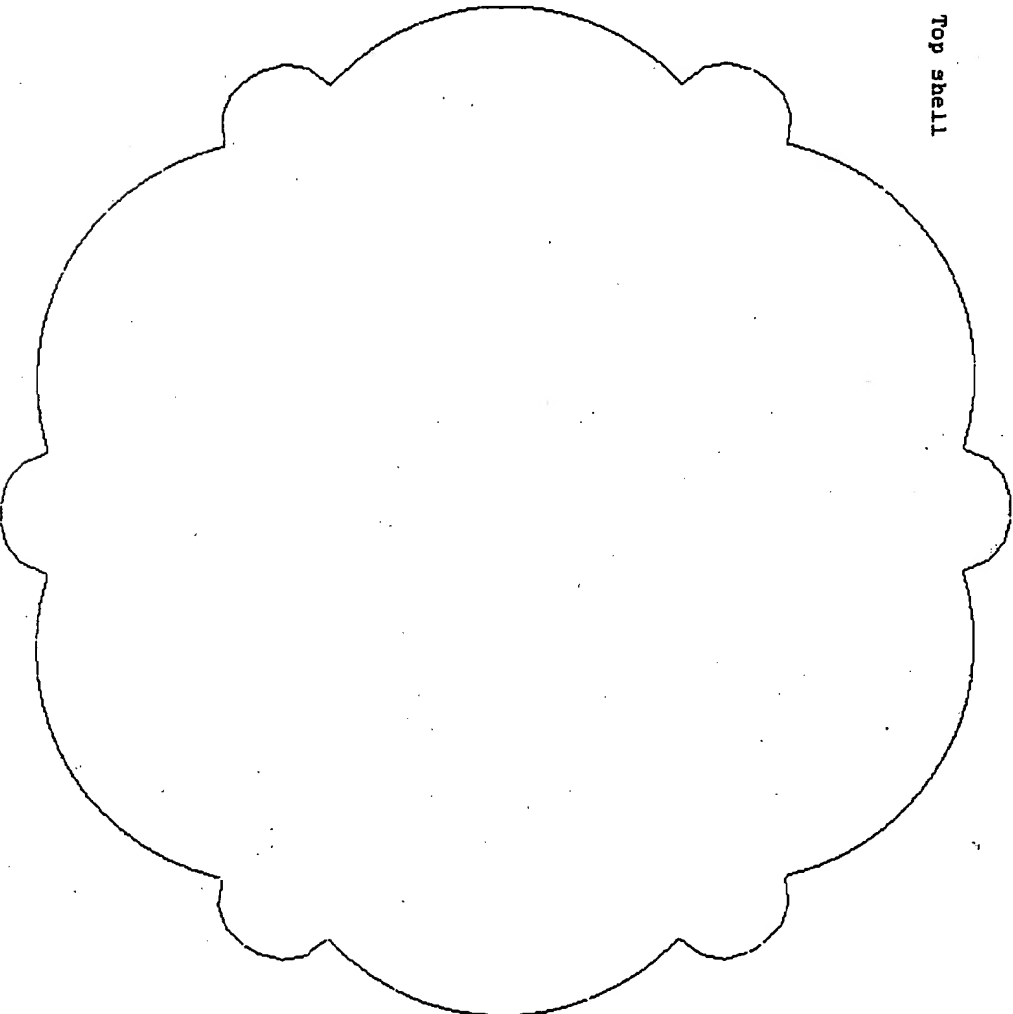


```

I-DEAS Visualizer
Display 1
China_Gacorade_Patent_Doubly_Convex
B.C. 1, TIME = 0.75, DISPLACEMENT_29
d:\user\Chinagate.mfl
DISPLACEMENT Magnitude Unaveraged Top shell
Min: 0.00E+00 mm Max: 3.41E+00 mm
B.C. 1, TIME = 0.75, DISPLACEMENT_29
d:\user\Chinagate.mfl
DISPLACEMENT XYZ Magnitude
Min: 0.00E+00 mm Max: 3.41E+00 mm
Part Coordinate System
    
```



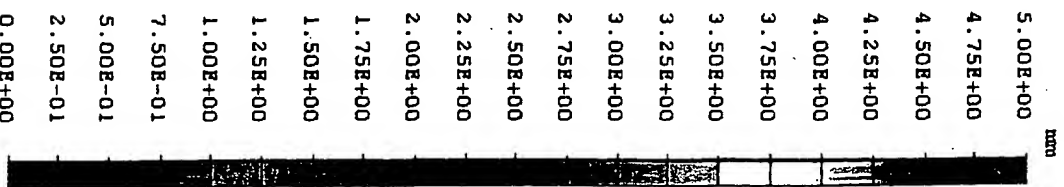
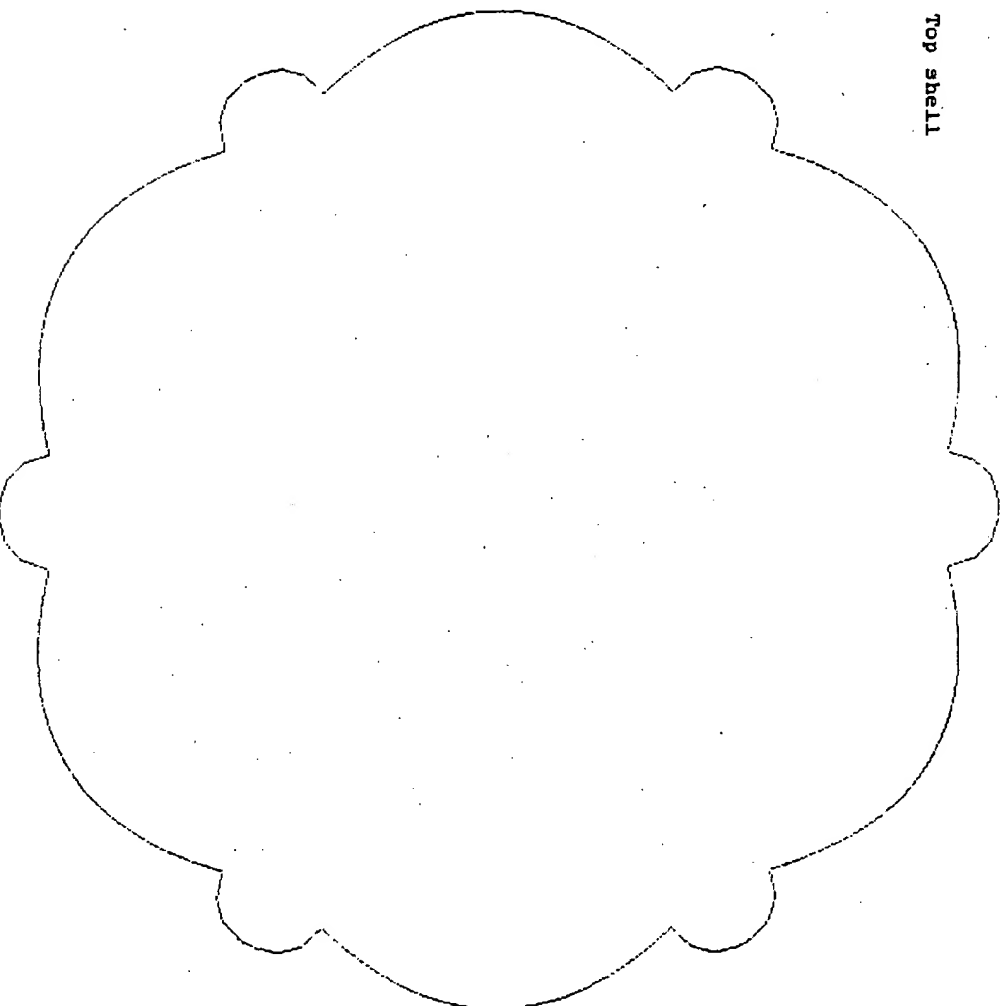
I-DEAS Visualizer  
 Display 1  
 China\_Gatcorade\_Patent\_Doubly\_Convex  
 B.C. 1, TIME = 0.05, DISPLACEMENT\_1  
 d:\user\Chinagate.mfl  
 DISPLACEMENT Magnitude Unaveraged Top shell  
 Min: 1.13E-01 mm Max: 1.96E-01 mm  
 B.C. 1, TIME = 0.05, DISPLACEMENT\_1  
 d:\user\Chinagate.mfl  
 DISPLACEMENT XYZ Magnitude  
 Min: 1.13E-01 mm Max: 1.96E-01 mm  
 Part Coordinate System





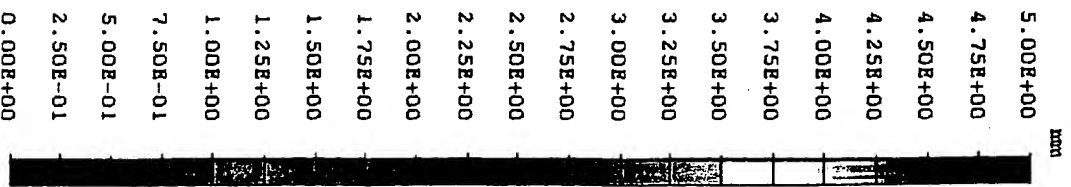
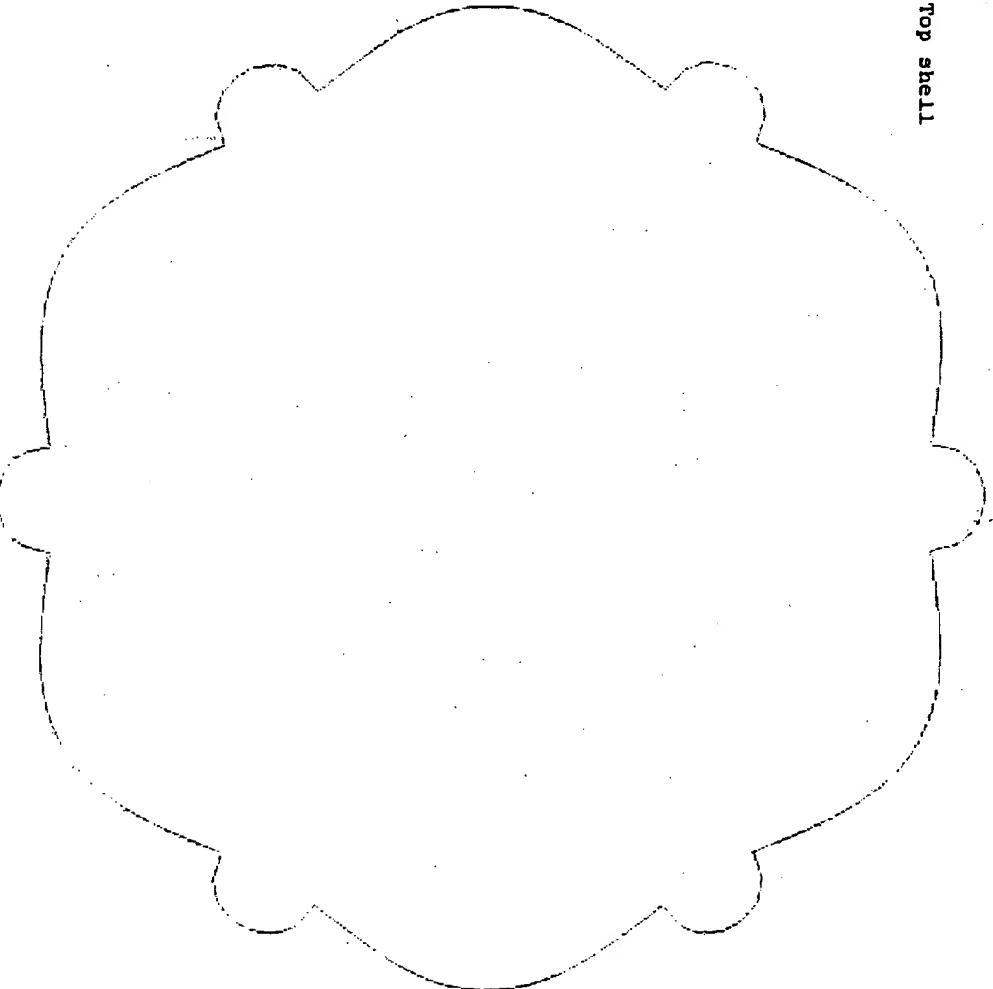
```

I-DEAS Visualizer
Display 1
China_Gatortrade_Patent_Doubly_Convex
B.C. 1, TIME = 0.25, DISPLACEMENT_9
d:\user\Chinagate.mtl
DISPLACEMENT Magnitude Unaveraged Top shell
Min: 5.63E-01 mm Max: 9.78E-01 mm
B.C. 1, TIME = 0.25, DISPLACEMENT_9
d:\user\Chinagate.mtl
DISPLACEMENT XYZ Magnitude
Min: 5.63E-01 mm Max: 9.78E-01 mm
Part Coordinate System
    
```

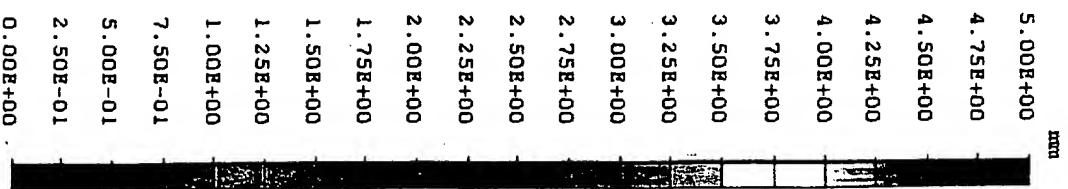
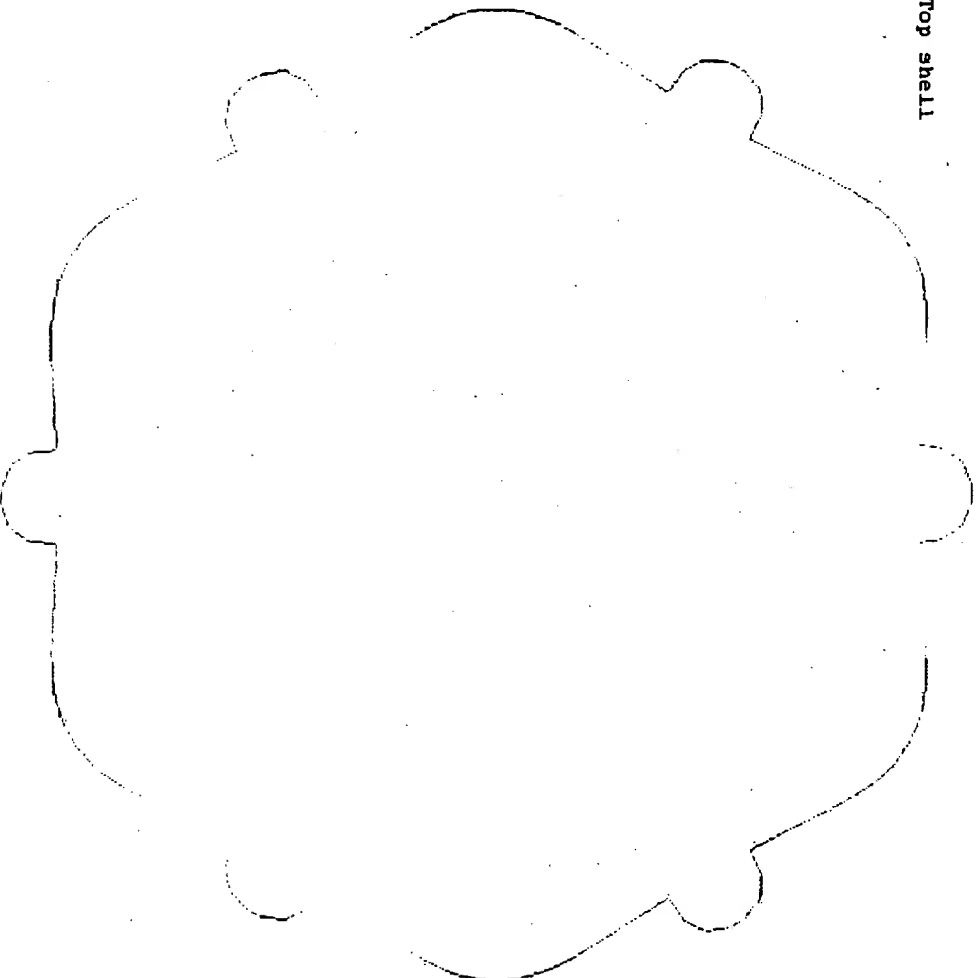


```

I-DEAS Visualizer
Display 1
China_Gatcorade_Patent_Doubly_Convex
B.C. 1, TIME = 0.5, DISPLACEMENT_19
d:\user\Chinagate.mtl
DISPLACEMENT Magnitude Unaveraged Top shell
Min: 1.17E+00 mm Max: 1.99E+00 mm
B.C. 1, TIME = 0.5, DISPLACEMENT_19
d:\user\Chinagate.mtl
DISPLACEMENT XYZ Magnitude
Min: 1.17E+00 mm Max: 1.99E+00 mm
Part Coordinate System
    
```



I-DEAS Visualizer  
 Display 1  
 China\_Gatcorade\_Patent\_Doubly\_Convex  
 B.C. 1, TIME = 0.75, DISPLACEMENT\_29  
 d:\user\Chinagate.mfl  
 DISPLACEMENT Magnitude Unaveraged Top shell  
 Min: 1.50E+00 mm Max: 3.40E+00 mm  
 B.C. 1, TIME = 0.75, DISPLACEMENT\_29  
 d:\user\Chinagate.mfl  
 DISPLACEMENT XYZ Magnitude  
 Min: 1.50E+00 mm Max: 3.40E+00 mm  
 Part Coordinate System



Serial No: 09/689,957

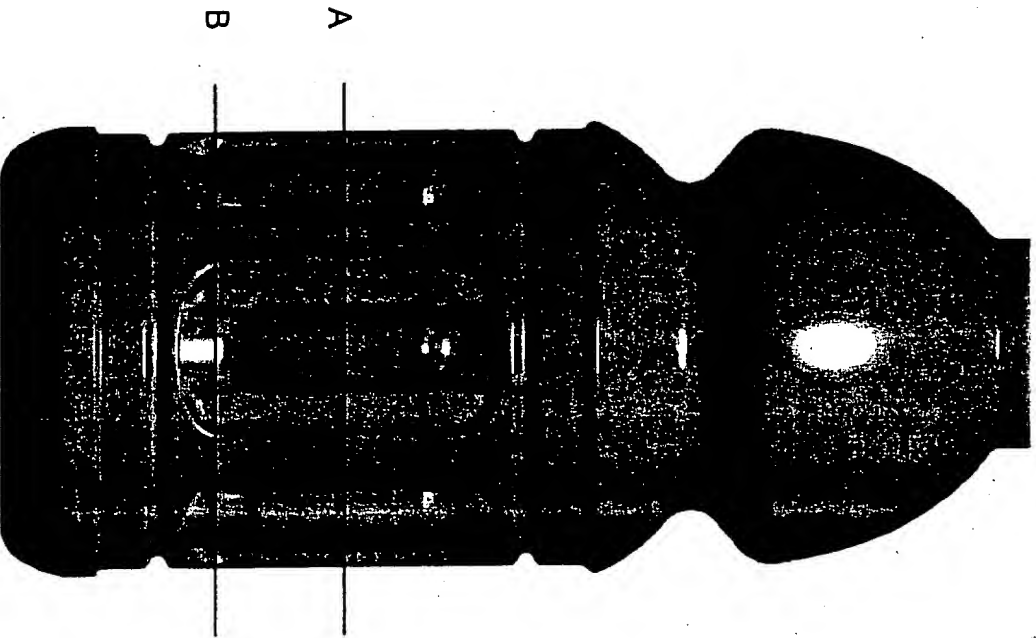
## **APPENDIX C - Container 4 (Vallencourt) FEA**

CONTAINER #4

-

V6

A container comprising 6 panel shapes as disclosed in the Valliencourt invention.

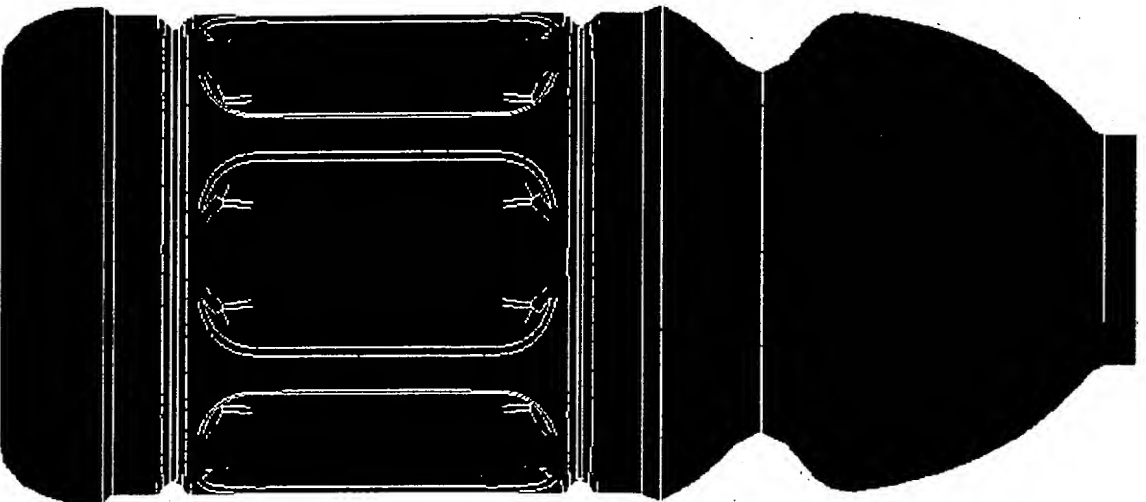


# Pressure Step 1

File Edit View Options Tools Window Help

## V6 Finite Element Analysis

I-DEAS Visualizer  
Display 1  
China\_Gatcorade\_Patent\_Vaillencourt  
B.C. 1, TIME = 0.05, DISPLACEMENT\_1  
d:\user\Chinegate.mfl  
DISPLACEMENT Magnitude Unaveraged Top shell  
Min: 0.00E+00 mm Max: 4.05E-01 mm  
B.C. 1, TIME = 0.05, DISPLACEMENT\_1  
d:\user\Chinegate.mfl  
DISPLACEMENT XYZ Magnitude  
Min: 0.00E+00 mm Max: 4.05E-01 mm  
Part Coordinate System



5.00E+00  
4.75E+00  
4.50E+00  
4.25E+00  
4.00E+00  
3.75E+00  
3.50E+00  
3.25E+00  
3.00E+00  
2.75E+00  
2.50E+00  
2.25E+00  
2.00E+00  
1.75E+00  
1.50E+00  
1.25E+00  
1.00E+00  
7.50E-01  
5.00E-01  
2.50E-01  
0.00E+00



# Pressure Step 2

File Edit View Options Tools Window Help

## V6 Finite Element Analysis

I-DEAS Visualizer

Display 1

China\_Gatcorade\_Patent\_Vaillencourt

B.C. 1, TIME = 0.25, DISPLACEMENT\_9

d:\user\Chinegate.mfl

DISPLACEMENT Magnitude Unaveraged Top shell

Min: 0.00E+00 mm Max: 1.31E+00 mm

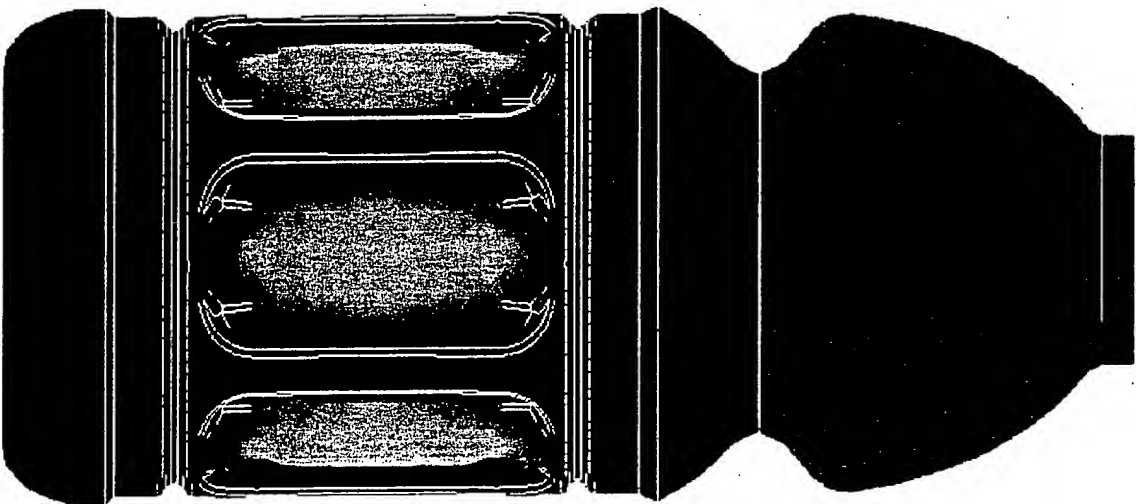
B.C. 1, TIME = 0.25, DISPLACEMENT\_9

d:\user\Chinegate.mfl

DISPLACEMENT XYZ Magnitude

Min: 0.00E+00 mm Max: 1.31E+00 mm

Part Coordinate System



5.00E+00  
4.75E+00  
4.50E+00  
4.25E+00  
4.00E+00  
3.75E+00  
3.50E+00  
3.25E+00  
3.00E+00  
2.75E+00  
2.50E+00  
2.25E+00  
2.00E+00  
1.75E+00  
1.50E+00  
1.25E+00  
1.00E+00  
7.50E-01  
5.00E-01  
2.50E-01  
0.00E+00



# Pressure Step 3

File Edit View Options Tools Window Help

## V6 Finite Element Analysis

I-DEAS Visualizer

Display 1

China\_Gatorade\_Patent\_Vaillencourt

B.C. 1, TIME = 0.5, DISPLACEMENT\_19

d:\user\Chinegate.mfl

DISPLACEMENT Magnitude Unaveraged Top shell

Min: 0.00E+00 mm Max: 2.32E+00 mm

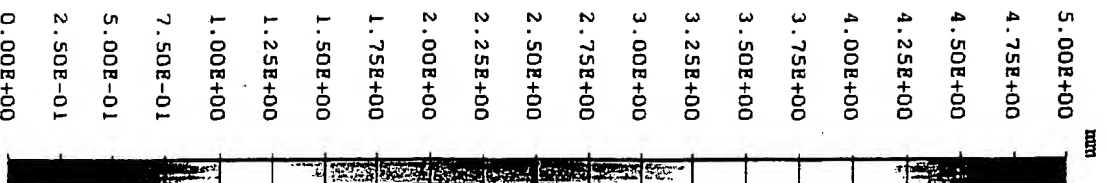
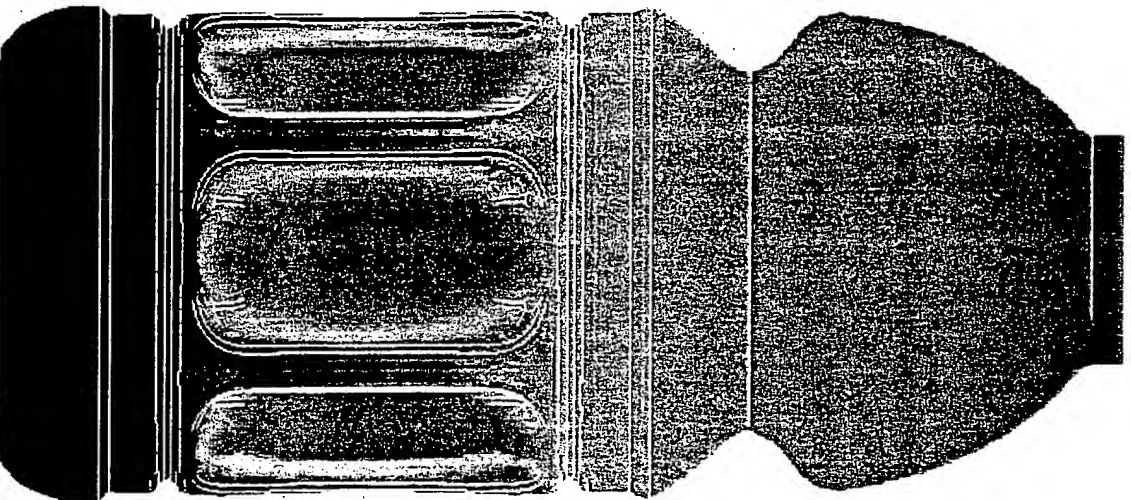
B.C. 1, TIME = 0.5, DISPLACEMENT\_19

d:\user\Chinegate.mfl

DISPLACEMENT XYZ Magnitude

Min: 0.00E+00 mm Max: 2.32E+00 mm

Part Coordinate System



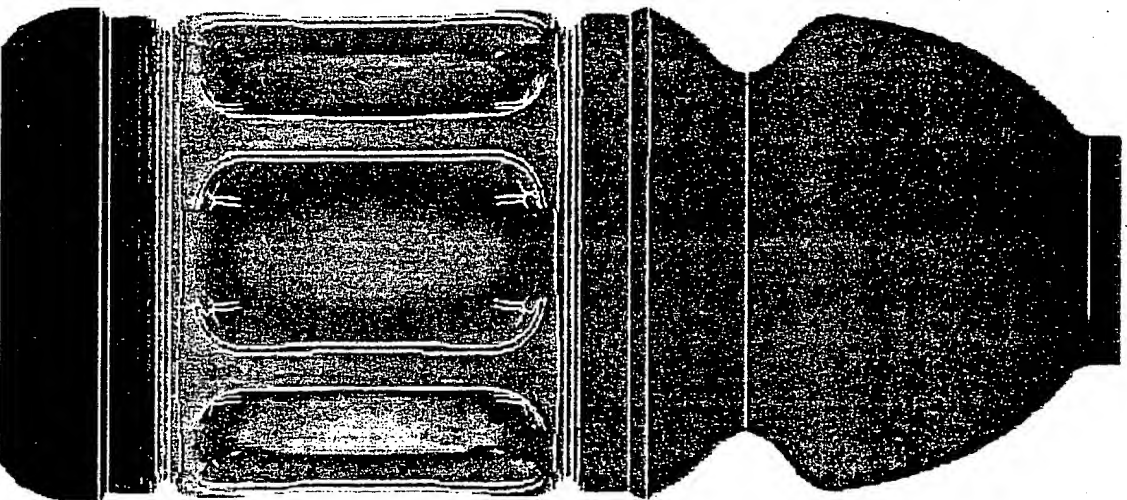


# Pressure Step 4

File Edit View Options Tools Window Help

## V6 Finite Element Analysis

I-DEAS Visualizer  
Display 1  
China\_Gatorade\_Patent\_Vaillencourt  
B.C. 1, TIME = 0.75, DISPLACEMENT\_29  
d:\user\Chinagate.mfl  
DISPLACEMENT Magnitude Unaveraged Top shell  
Min: 0.00E+00 mm Max: 3.50E+00 mm  
B.C. 1, TIME = 0.75, DISPLACEMENT\_29  
d:\user\Chinagate.mfl  
DISPLACEMENT XYZ Magnitude  
Min: 0.00E+00 mm Max: 3.50E+00 mm  
Part Coordinate System



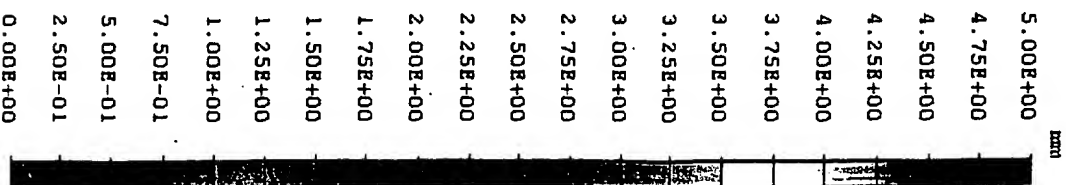
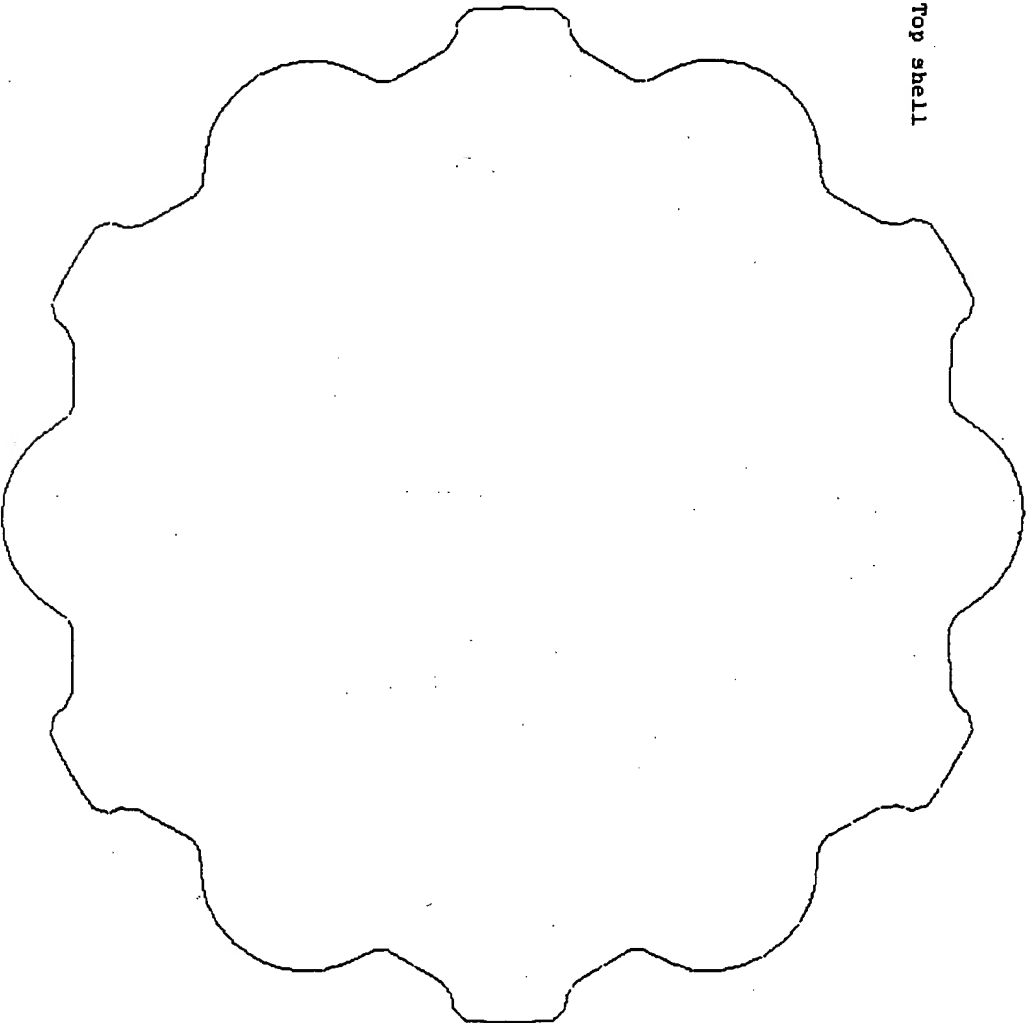
mm  
5.00E+00  
4.75E+00  
4.50E+00  
4.25E+00  
4.00E+00  
3.75E+00  
3.50E+00  
3.25E+00  
3.00E+00  
2.75E+00  
2.50E+00  
2.25E+00  
2.00E+00  
1.75E+00  
1.50E+00  
1.25E+00  
1.00E+00  
7.50E-01  
5.00E-01  
2.50E-01  
0.00E+00



Pressure Step 1

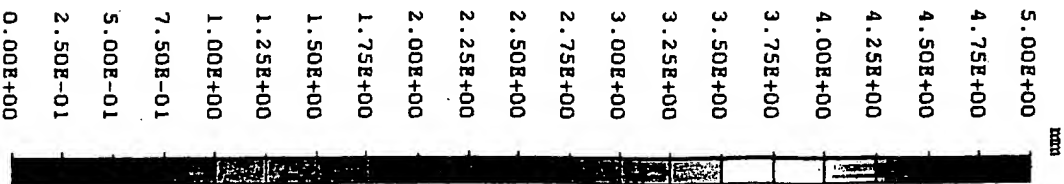
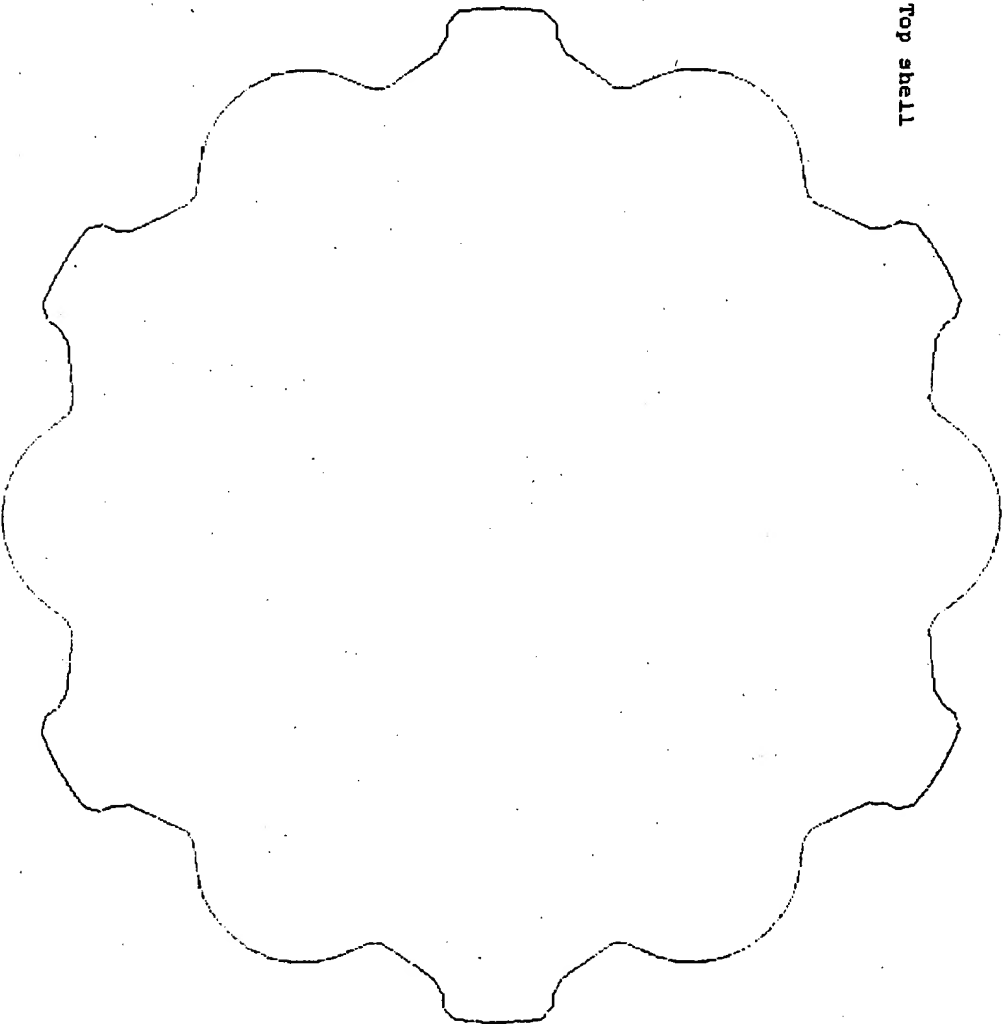
SECTION A-A

I-DEAS Visualizer  
Display 1  
China\_Garorade\_Patent\_Vaillencourt  
B.C. 1, TIME = 0.05, DISPLACEMENT\_1  
d:\user\Chinegate.mfl  
DISPLACEMENT Magnitude Unaveraged Top shell  
Min: 6.42E-02 mm Max: 1.75E-01 mm  
B.C. 1, TIME = 0.05, DISPLACEMENT\_1  
d:\user\Chinegate.mfl  
DISPLACEMENT XYZ Magnitude  
Min: 6.42E-02 mm Max: 1.75E-01 mm  
Part Coordinate System



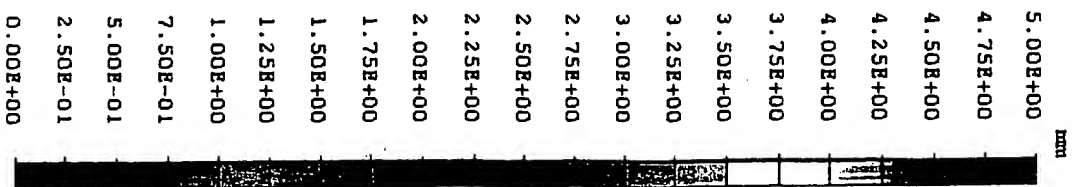
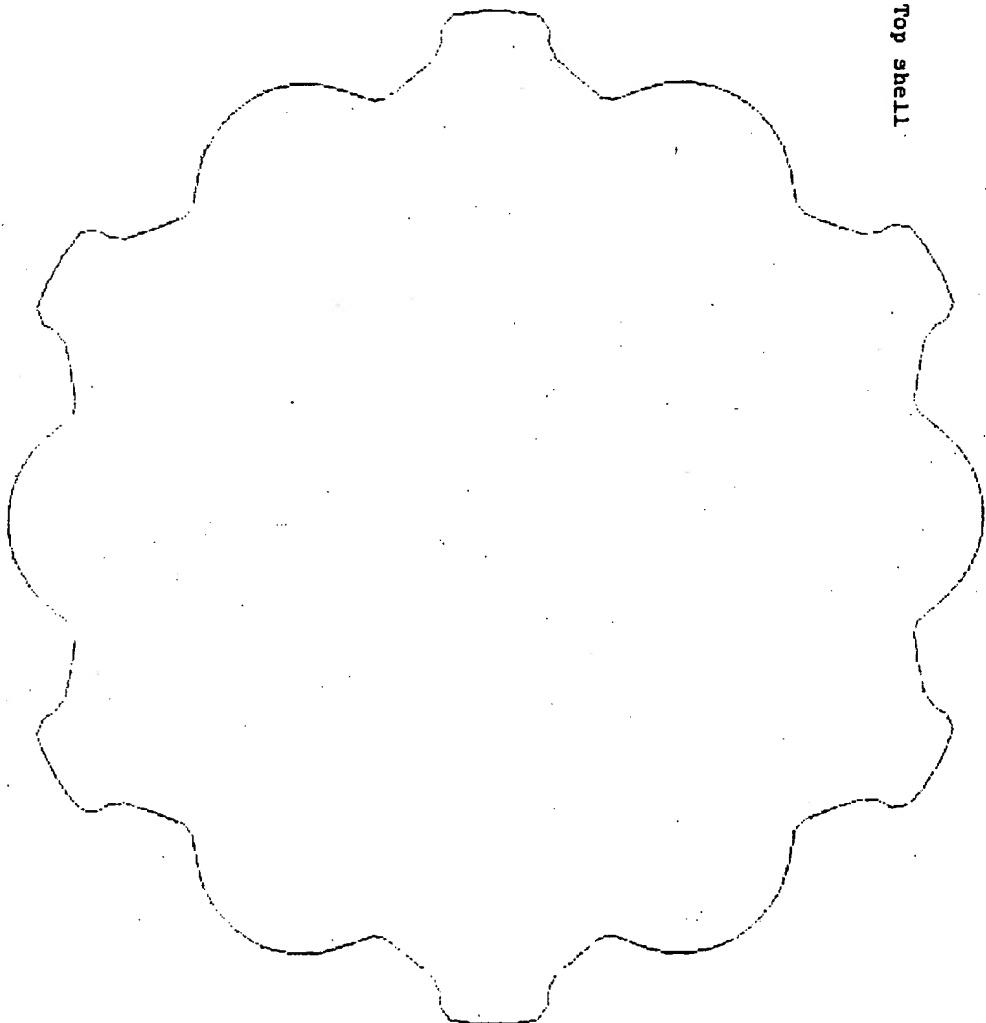
I-DEAS Visualizer  
 Display 1  
 China\_Gatorade\_Patent\_Vaillencourt  
 B.C. 1, TIME = 0.25, DISPLACEMENT\_9  
 d:\user\Chingate.mtl  
 DISPLACEMENT Magnitude Unaveraged  
 Min: 3.49E-01 mm Max: 9.75E-01 mm  
 B.C. 1, TIME = 0.25, DISPLACEMENT\_9  
 d:\user\Chingate.mtl  
 DISPLACEMENT XYZ Magnitude  
 Min: 3.49E-01 mm Max: 9.75E-01 mm  
 Part Coordinate System

Top shell



SECTION A-A

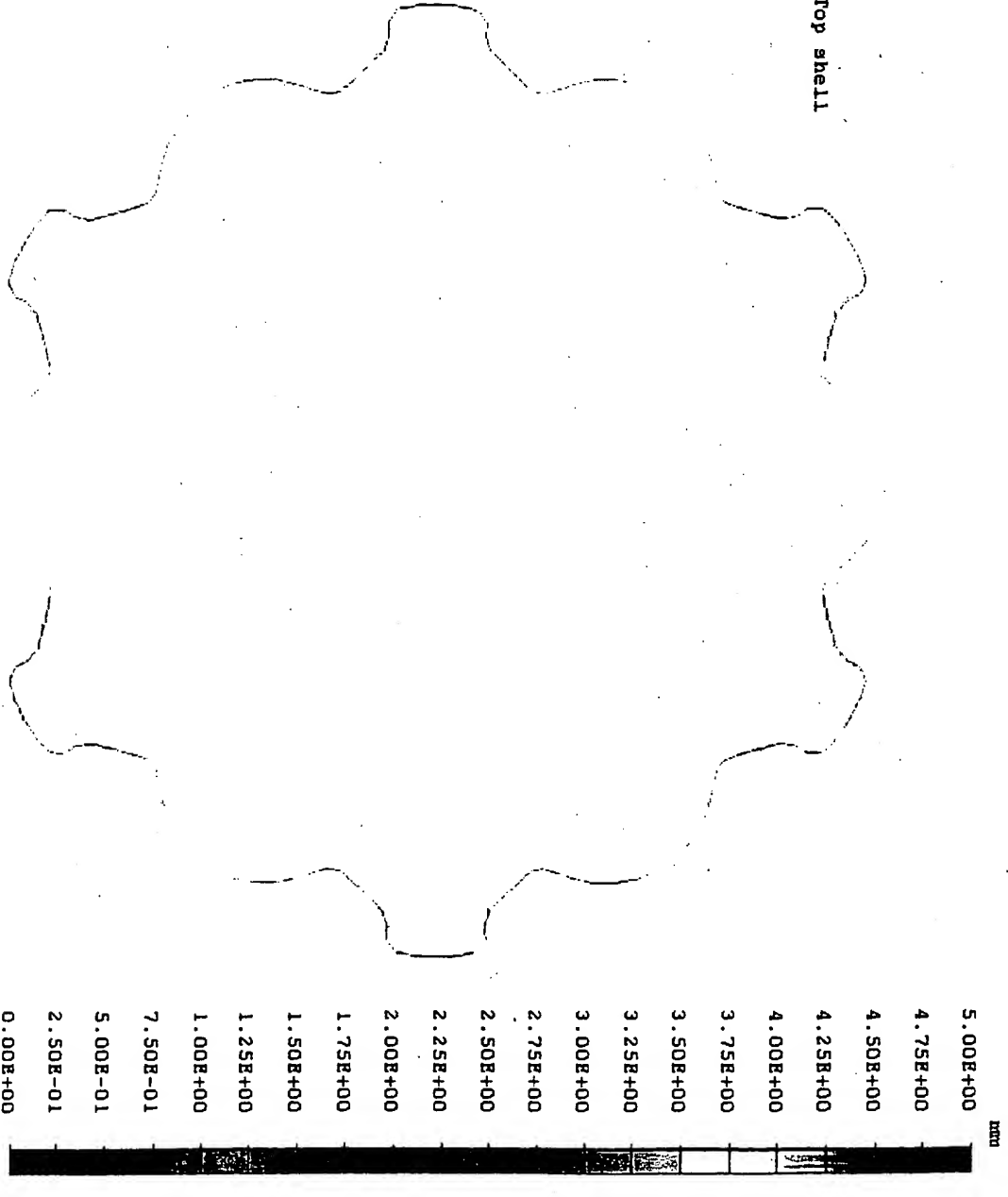
I-DEAS Visualizer  
 Display 1  
 China\_Gatortade\_Patent\_Vallencourt  
 B.C. 1, TIME = 0.5, DISPLACEMENT\_19  
 d:\user\ChinaGate.mf1  
 DISPLACEMENT Magnitude Unaveraged Top shell  
 Min: 7.80E-01 mm Max: 2.04E+00 mm  
 B.C. 1, TIME = 0.5, DISPLACEMENT\_19  
 d:\user\ChinaGate.mf1  
 DISPLACEMENT XYZ Magnitude  
 Min: 7.80E-01 mm Max: 2.04E+00 mm  
 Part Coordinate System



# Pressure Step 4

## SECTION A-A

I-DEAS Visualizer  
 Display 1  
 China\_Gatorade\_Patent\_Vaillencourt  
 B.C. 1, TIME = 0.75, DISPLACEMENT\_29  
 d:\user\Chinagate.mtl  
 DISPLACEMENT Magnitude Unaveraged Top shell  
 Min: 1.42E+00 mm Max: 3.16E+00 mm  
 B.C. 1, TIME = 0.75, DISPLACEMENT\_29  
 d:\user\Chinagate.mtl  
 DISPLACEMENT XYZ Magnitude  
 Min: 1.42E+00 mm Max: 3.16E+00 mm  
 Part Coordinate System



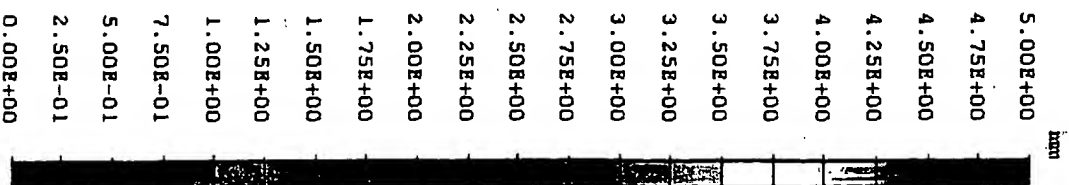
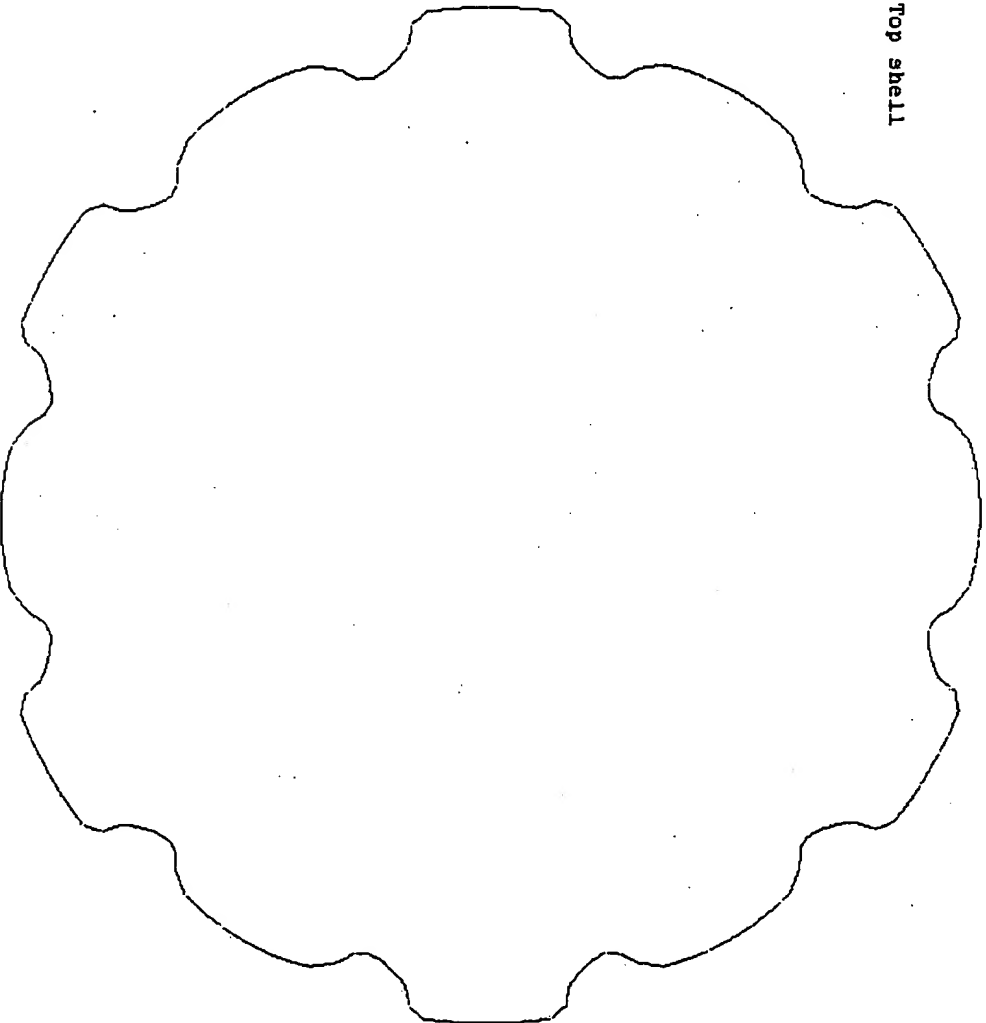
# Pressure Step 1

## SECTION B-B

```

I-DEAS Visualizer
Display 1
China_Gatcorade_Patent_Vaillencourt
B.C. 1, TIME = 0.05, DISPLACEMENT_1
d:\user\Chinagate.mfl
DISPLACEMENT Magnitude Unaveraged
Min: 6.64E-02 mm Max: 1.27E-01 mm
B.C. 1, TIME = 0.05, DISPLACEMENT_1
d:\user\Chinagate.mfl
DISPLACEMENT XYZ Magnitude
Min: 6.64E-02 mm Max: 1.27E-01 mm
Part Coordinate System
    
```

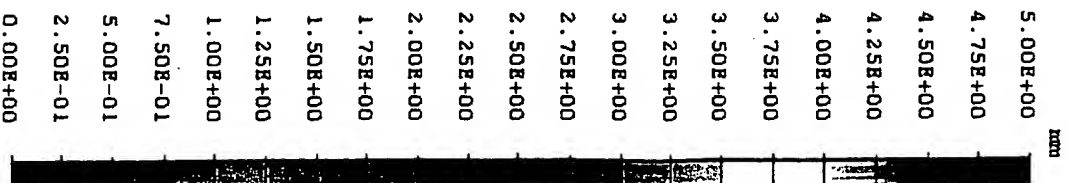
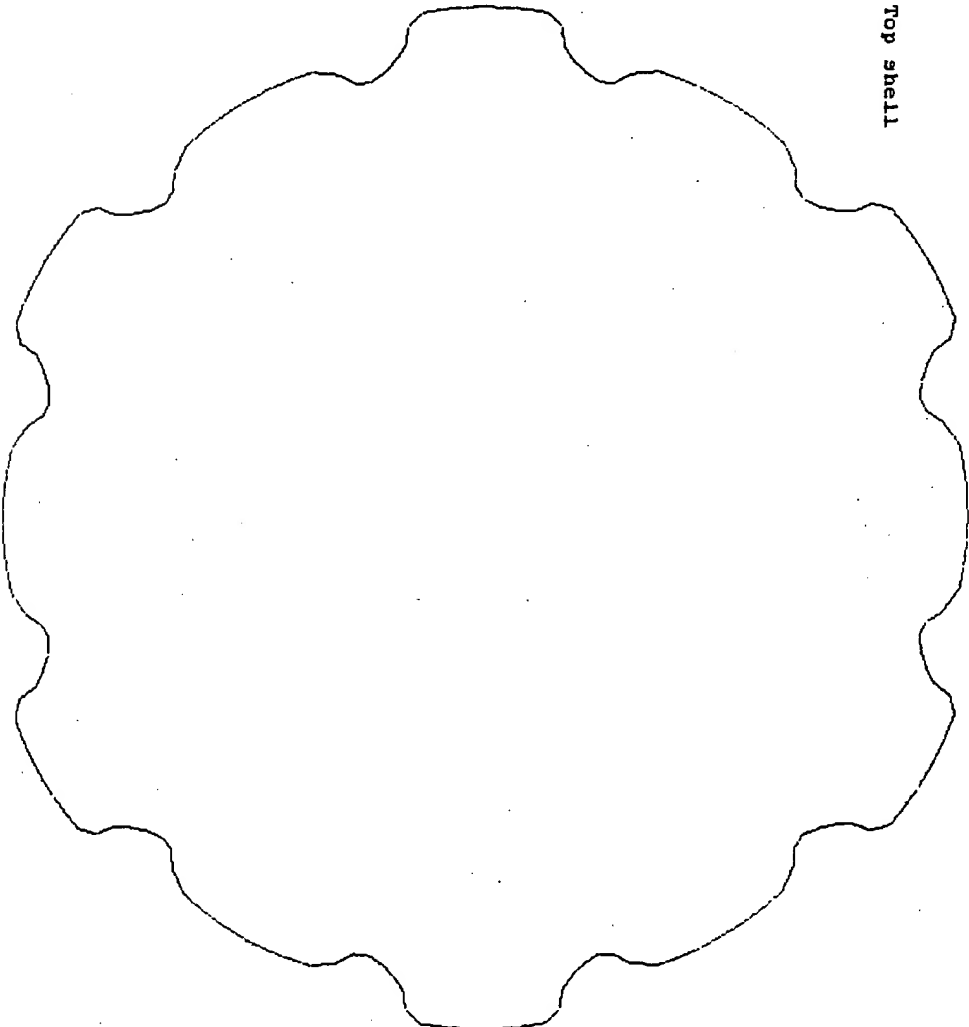
Top shell



# Pressure Step 2

## SECTION B-B

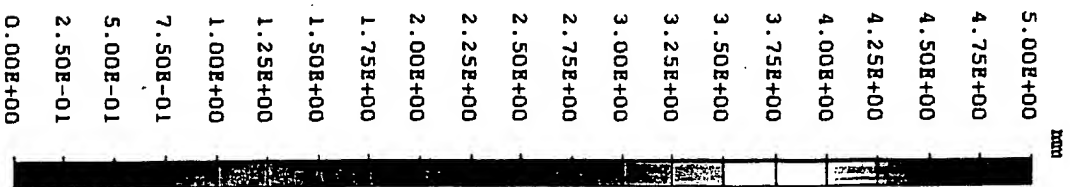
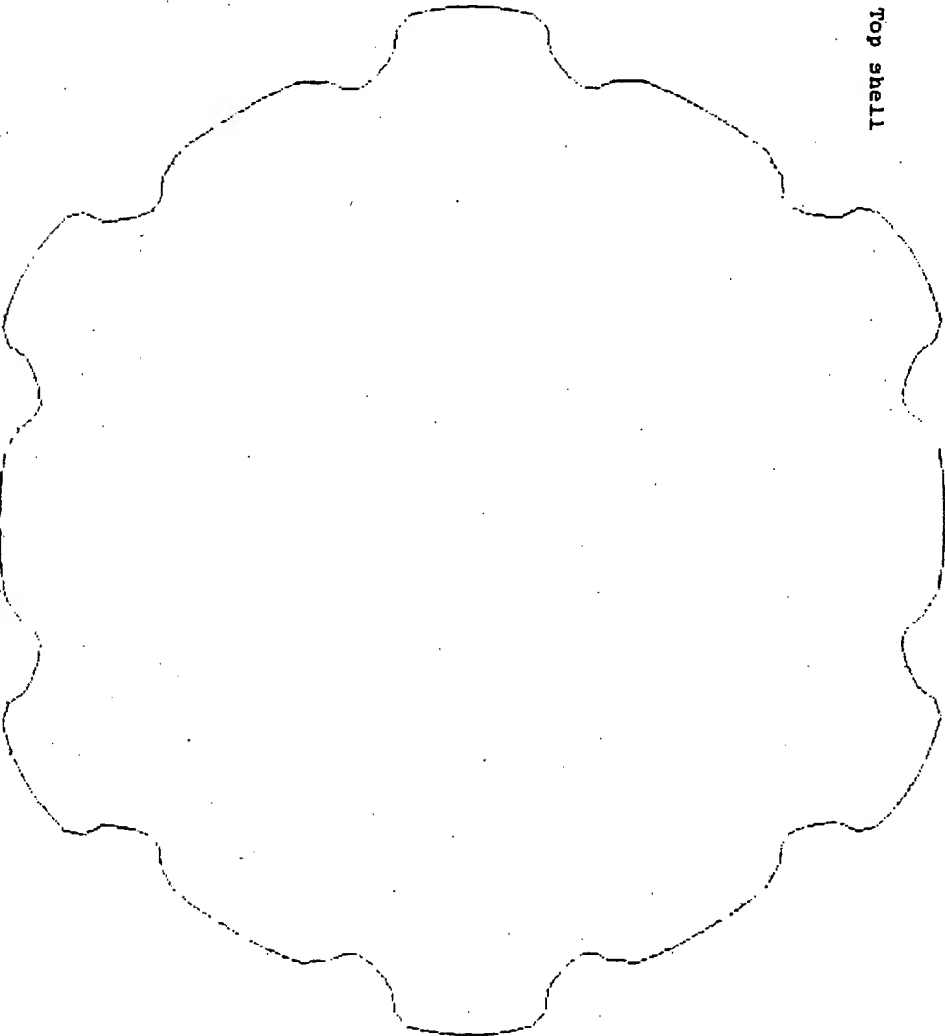
I-DEAS Visualizer  
 Display 1  
 China\_Gatcorade\_Patent\_Vallencourt  
 B.C. 1, TIME = 0.25, DISPLACEMENT\_9  
 d:\user\Chinagate.mf1  
 DISPLACEMENT Magnitude Unaveraged Top shell  
 Min: 3.85E-01 mm Max: 7.63E-01 mm  
 B.C. 1, TIME = 0.25, DISPLACEMENT\_9  
 d:\user\Chinagate.mf1  
 DISPLACEMENT XYZ Magnitude  
 Min: 3.85E-01 mm Max: 7.63E-01 mm  
 Part Coordinate System



# Pressure Step 3

## SECTION B-B

I-DEAS Visualizer  
 Display 1  
 China\_Gatcorede\_Patent\_Vaillencourt  
 B.C. 1, TIME = 0.5, DISPLACEMENT\_19  
 d:\user\Chinagate.mtl  
 DISPLACEMENT Magnitude Unaveraged Top shell  
 Min: 8.59E-01 mm Max: 1.63E+00 mm  
 B.C. 1, TIME = 0.5, DISPLACEMENT\_19  
 d:\user\Chinagate.mtl  
 DISPLACEMENT XYZ Magnitude  
 Min: 8.59E-01 mm Max: 1.63E+00 mm  
 Part Coordinate System





# Pressure Step 4

## SECTION B-B

```

I-DEAS Visualizer
Display 1
China_Gatcorade_Pacenc_Vallencourt
B.C. 1, TIME = 0.75, DISPLACEMENT_29
d:\user\Chinagate.mtl
DISPLACEMENT Magnitude Unaveraged Top shell
Min: 1.51E+00 mm Max: 2.55E+00 mm
B.C. 1, TIME = 0.75, DISPLACEMENT_29
d:\user\Chinagate.mtl
DISPLACEMENT XYZ Magnitude
Min: 1.51E+00 mm Max: 2.55E+00 mm
Part Coordinate System
    
```

